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REPORTS

STUDIES ON HYPERTROPHY AND CANCER OF THE PROSTATE

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STUDIES ON HYPERTROPHY AND CANCER OF THE PROSTATE

BY

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THE TREATMENT OF PROSTATIC HYPERTROPHY BY CONSERVATIVE PERINEAL PROSTATECTOMY.

AN ANALYSIS OF CASES AND RESULTS BASED ON A DETAILED REPORT OF 145 CASES.

By HUGH H. YOUNG, M. D.

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PREFACE.

I. Misleading Statements and Statistics in the Literature.

The following paper is the result of numerous articles which have appeared recently, demanding more detailed information as to the pre- and post-operative condition of patients on whom perineal prostatectomy has been performed.

The promulgation of successful methods of removing hypertrophied prostates, and the assertion of their benignity has been followed by their wholesale employment by men unprepared to do these operations, and as a result a considerable mortality has been produced and many of the operative results have been unsatisfactory.

Many physicians without special operative training, doing a surgical operation only now and then, without the requisite knowledge of the rather intricate anatomy of the perineum, and the pathology and mechanics of the prostatic obstructions, have boldly essayed to operate these cases and as a result a frightful mortality and a horrible record as to results and complications has been recorded against a benign and thoroughly successful procedure.

It is not surprising then that Whiteside finds a mortality of 20% in 36 cases reported by nine operators, and absolutely good results in only 30% of the cases, and that Belfield and Pedersen after making similar studies should send out "timely" warnings against prostatectomy as a routine procedure, and that we should hear of "a return to conservative methods," non-operative treatment, the catheter life (with all its horrors!), and the "selection of cases" which are suitable for operation.

If the reaction against operation which has been aroused (for the pendulum once started backward must continue its swing) results in discouraging men unprepared to do good work in this line, men who cannot use and decry the using of the cystoscope and ignorantly neglect to take advantage of its often great assistance, and who rush in

blindly without knowing, seeing or apparently caring what they are doing, much will be gained. But if the medical profession is unduly alarmed and, returning to the old so-called conservative methods relegates such patients to miserable catheter lives, and refuses them the splendid results obtainable by accurate methods, much will be lost.

Such is the history of all advances in surgery—first the demonstration of valuable new procedures, then a horde of bungled operations, then a discovery of miserable results and a startling mortality, then a reaction against the procedure, and finally, but after the loss of many valuable years, a return to the truth.

When one has had during the past year 50 consecutive operations, with but one immediate or remote death (and this patient in extremis at time of operation), with no complications of the slightest moment, and no bad results it is not wonderful that he feels outraged by the presentation of a mortality of 20% and successful results in only 30% in 36 cases operated on by nine surgeons!

There have also been those of experience and knowledge, but champions of the suprapubic route, who have savagely attacked perineal prostatectomy (without having tried the procedure).

For example, in the Transactions of the Medical Society of London for May 8, 1905 (Vol. XXVIII), in a discussion on "The Perineal and Suprapubic Methods of Prostatectomy," one of the members is reported to have thus delivered himself:

"Mr. P. J. Freyer remarked that he had not come either to read a paper or to make a speech on the subject, as his views with reference to removal of the prostate had already been placed before the Profession in numerous lectures and papers which had been published in the journals during the last four years. He congratulated the Society that it had awakened from what appeared to be a lethargy with regard to the great subject of removal of the prostate. It seemed extraordinary that during the past four years, when the subject had been so much discussed, the oldest medical society in London should not have hitherto invited discussion upon it. He thanked his old friend and colleague, Mr. Harrison, for the full-hearted eulogium which he had been good enough to pronounce upon his (Mr. Freyer's) operation, which was all the more gratifying as Mr. Harrison's views in that respect had been a plant of slow growth. When first introduced to the Profession the operation was not fully grasped by Mr. Harrison, who did not believe in its efficacy. With reference to the subject of perineal and suprapubic prostatectomy, he remarked that there was no comparison whatever capable of being introduced between the two operations, because they did not deal with the same subject. It was

only necessary in support of that view to read the details of operations when these details were given—for instance, the details given of perineal prostatectomy by Albarran, published in full in Proust's work on prostatectomy. He was not aware that details had been given elsewhere, certainly not in this country. One heard general statements about the success of perineal prostatectomy, but he wanted to see cases recorded in such a manner that one could place one's finger upon each case. There was no comparison, because prostatectomy by the perineal method did not deal with the same type of case as the suprapubic operation as advocated by him. The average age of the patients on whom perineal prostatectomy was undertaken was at least 10 or 15 years less than that of those cases undertaken by him. Amongst all the cases of perineal prostatectomy he had not yet seen an octogenarian mentioned, whereas he had performed his operation on 11 octogenarians, all of which had been successful. Next, by perineal prostatectomy one did not deal with large prostates, only with small, or comparatively small ones. He exhibited a prostate, weighing nearly one lb., which had been removed by him by the suprapubic method, from a patient aged 73, who had had 20 years of catheter life, but who was now in perfect health, able to pass his water and retain it as well as he ever could in his life. He asked whether anybody had ever attempted to approach such a case by the perineal route. Seeing that the prostate projecting into the bladder was merely covered by the mucous membrane of the bladder, if such an attempt were made the whole base of the bladder must be removed. He had brought for exhibition several specimens of prostates which he had removed, ranging in weight from nearly 1 lb. to ¾ oz. In reference to the remarks of Mr. Spencer concerning small prostates, prostates of this kind were extremely difficult to diagnose as to whether they were malignant or non-malignant before operation; and, if the pathologist was to be believed, also difficult to diagnose afterwards. Some time ago he removed a prostate of the nature of which he was doubtful, and sent specimens to two of the most distinguished pathologists in London. One pronounced it malignant, and the other non-malignant. The slides were then taken to a still more distinguished pathologist, who said he could not tell, as the subject was not worked up properly! He had not attended that evening to decry the operation of perineal prostatectomy. He welcomed any operation which was in the interests of suffering humanity, but in looking over statistics of cases he noticed accidents and incidents in connection with perineal prostatectomy which were absent or extremely rare in connection with the suprapubic method. On looking over Albarran's cases he found that injury to the rectum was a very common accident in connection with the perineal method, with the result that recto-vesical fistula occurred, also recto-urethral fistula, and perineal fistula. Orchitis also occurred extremely commonly. Orchitis sometimes occurred in connection with the suprapubic operation, but he had never seen a severe type of it. It lasted only a few days and gave only a little trouble. Incontinence of urine was also extremely

common in connection with the perineal method, but in the other it was practically entirely absent. No doubt there were a few cases in whom there occurred the phenomenon which he could only liken to the state of a child. The person felt he must empty his bladder at once to save wetting his trousers; but that passed off in a short time. Stricture was very common in connection with perineal prostatectomy. He could endorse what Mr. Harrison had said, and say that in no case in which the suprapubic operation had been done had he found stricture. The convalescence after the perineal method was also longer than after the suprapubic. A point particularly dwelt upon in the French journals was that after the perineal operation there was loss of sexual power, a point of considerable importance when dealing with a comparatively young man. His experience of the suprapubic prostatectomy was that it was not accompanied by loss of sexual power, though in some cases there was no emission of semen, because the ejaculatory ducts were torn across; and in some cases there was an emission of semen into the bladder, and it passed away with the next act of micturition. In some there was an actual discharge of semen naturally. In the 110 cases which were recorded by him some time ago in 'The Lancet,' there was a mortality of 9 per cent, but as the death occurred in the first 100 cases, one would take the mortality at 10 per cent. Since then he had done 85 prostatectomies with five deaths, giving a mortality of 5.8 per cent. Thus it would be seen that his anticipations about the operation were being fulfilled, namely, that with careful treatment and simplicity and rapidity of operation, with improvements in the various contingent circumstances connected with the operation, the mortality would undoubtedly decrease. It was remarkable that the mortality in hospital cases was much higher than in private. Out of 46 hospital cases there were seven deaths, or 15.22 per cent; whereas in 139 cases in private there were eight deaths only, or a mortality of 5.75 per cent. He could not say what was the cause of that difference, unless it was that each private patient occupied a separate room, and had two nurses to attend to him, which could not be afforded in hospital."

It is evident, therefore, that there is a crying need of careful and complete reports of cases in order to dissipate the false impression as regards the results in this country, and to remove the absolutely unjust, not to say false, idea of perineal prostatectomy which has been disseminated elsewhere. It is for this reason that I have decided to publish the complete details of my cases with an exhaustive analysis at a risk of taking up an inordinate amount of valuable space.

Comparisons are odious and I shall not indulge in any comparative study of results, but those who are interested will find reported all that is pertinent in 145 consecutive cases without the exclusion of a single disagreeable result.

In this report I have not given the details of five cases in which perineal prostatectomy was performed thinking that the prostate was benign when subsequent examination showed that it was malignant, six cases which were under my care but were turned over to assistants (the operation being partly performed by me), three cases of perineal prostatectomy done without the tractor, and four cases of perineal prostatectomy for chronic prostatitis. Most of these cases will be found reported in more or less complete detail in other portions of this volume, in the articles on carcinoma and prostatitis. There were no cases of rectal fistula, or other bad results among them so that nothing is being concealed. The present study of cases is intended to include only those operated by a special technique and of a benign hypertrophic character.

II. The Operation of Conservative Perineal Prostatectomy.

In several publications which have appeared at intervals during the past four years, I have described a so-called method of conservative perineal prostatectomy and reported lists of cases.

The development of the operation and the reasons for the various improvements were described as follows in my first publication in the Journal of the American Medical Association,[1] October 24, 1903.

The literature of the prostate and its operative treatment has become so vast that I will not attempt to discuss the many valuable articles which bear on this subject, but will simply present a résumé of my own work and the problems which have presented themselves.

My first prostatectomy was in 1898, a patient on whom a suprapubic opening had been made for drainage. At this operation a tre-

[1] The use of a new tractor for perineal prostatectomy was first described in a discussion at a meeting of the Southern Surgical and Gynecological Association, on November 12, 1902; a second report was made and a perfected technique by which the ejaculatory ducts were preserved, described at a meeting of the Medical and Chirurgical Faculty of Maryland in April, 1903. A more complete report was made before the American Association of Genito-Urinary Surgeons, May 12, 1903, and was published in the Journal of the American Medical Association, October 24, 1903.

Since then additional reports have been made in the Monatsberichte für Urologie, Bd. IX, Heft 5 u. 6, 1904. Journal of the American Medical Association, October 4, 1903. The Annals of Surgery, April, 1905, and the Journal of the American Medical Association, 1905.

mendous intravesical outgrowth of the middle lobe was found, and as there was very little enlargement of the lateral lobes, I enucleated the mass through the suprapubic wound, with the assistance of a finger in the rectum (Fig. 1), a method which has also been employed by Guiteras, and described by him in 1900.

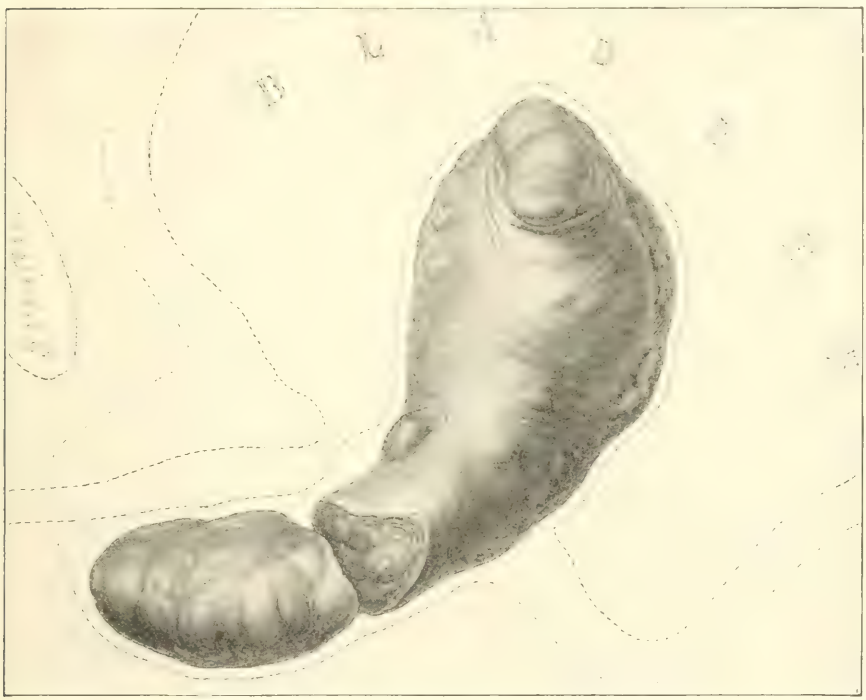


FIG. 1.—A large intravesical median lobe removed by suprapubic route. Actual size.

The next three cases presented no median enlargements, the hypertrophy being confined to the lateral lobes. Following the advice of Alexander, I used the combined method, removing the lobes through the perineal wound with the assistance of a suprapubic incision. Although the operation was tedious and extensive, these patients did well, and in a paper on the subject I said that Alexander's was the operation of choice, except for middle lobe cases.

My next four cases were characterized by considerable middle lobe enlargements, and I therefore used the suprapubic route, and was surprised to find that with the assistance of the finger in the rectum I could easily enucleate very large lateral lobes in one piece with the median without destroying the urethra. The operation was also very much quicker—it frequently being possible to complete the enucleation in five to six minutes, whereas the combined operation would frequently take nearly an hour.

The principal objection to the perineal route was the necessity of the suprapubic incision to push the prostate down into the perineum where it could be enucleated, and I then thought of having an instrument made with two blades which could be inserted closed through a perineal urethrotomy, separated when in the bladder, and then used as a tractor to drag the prostate toward the perineum. This was in 1899, but I never had the instrument constructed, but continued to do all prostatectomies suprapubically. The results obtained were excellent, the greatest objection being the considerable hemorrhage following the operation, the great duration of the convalescence and the occasional development of suprapubic hernia afterward.

In 1899 several patients came to me who were so old and so weak that I was afraid to even administer a general anesthetic, much less to do so severe an operation as a suprapubic prostatectomy. One patient being unable to use a catheter, caused me to purchase a Bottini incisor, and the results which I obtained on extremely old and feeble men, under local cocaine anæsthesia, were indeed so marvellous that I adopted the Bottini operation as the method of choice in cases past 65 years of age, who were not in a prime surgical condition. Using my instrument with interchangeable blades of different size I was able to operate safely and radically on prostates of any size. I found it possible also to successfully attack large middle lobes by making an oblique incision with the cautery blade on each side of the pedicle, thus dropping it back out of the way, where it would afterward atrophy. In two years I operated thus on 40 cases, with two deaths, only one of which was due to the operation. Of these 15 were over 70 and three over 80, with no deaths, and with cures in all these cases but one.

I feel sure that many of these patients would have succumbed had a suprapubic or a combined prostatectomy under general anæsthesia been done, with the subsequent prolonged recumbent posture. The

use of cocaine, the little shock and hemorrhage produced by the Bottini, and the rapidity of the convalescence—out of bed on the second or third day—were the factors which contributed to save them. Since then I have used the cautery incisions on many more cases, some just as old and as desperate as those described above, with similar gratifying results.

The publications of Syms, Murphy, Ferguson, Bryson, and others within the past two years, caused me to turn my attention again to the perineal route. In studying the methods that have been proposed, the intravesical balloon, which Syms used to draw the prostate into the perineal wound, seemed to me to be much better suited to overcome the great objection to perineal prostatectomy, the depth of the wound with the consequent difficulty of reaching the lobes to enucleate them, than Murphy's hooks, Ferguson's capsular retractors, or Bryson's suprapubic prevesical incision.

The rubber balloon did not, however, appear to me to be quite perfect in that it did not seem to furnish sufficient strength for the great traction which is necessary, and the fact that Syms had acknowledged that he found a metal instrument devised by Gouley, which was passed like a sound into the bladder, of great assistance in pushing down the prostate, confirmed me in my opinion that while the idea of making traction by means of an instrument which could be introduced into the bladder through a perineal urethrotomy wound was correct, the method adopted by Syms—the rubber balloon and the tube—could be improved on.

I therefore set to work to construct an instrument of metal for this purpose. After several months of experiment, during which I endeavored to discover and correct the faults of each model [1] by operative use, the instrument was completed, as shown in Illustrations 2 and 3. It consists of two fenestrated blades attached to shafts, one of which revolves around the other. When the two handles near the outer end which regulate the rotation are brought together the blades are approximated and in position for insertion into the bladder through the opening in the membranous urethra (Fig. 2). Once introduced above the intravesical limits of the prostatic lobes the blades may be separated by rotating the handles away from each other (Fig. 3),

[1] See Appendix, Case 1, p. 143, for description of first instrument used and p. 150 for the second modification.

when it is ready for whatever traction on its shaft may be necessary to draw the prostate well into the perineal wound. Before discussing the use of this instrument, however, I wish to discuss some problems of technic and conservatism which have been met.

The ejaculatory ducts.—The fact that many of the cases requiring prostatectomy are vigorous men in the fifties, with sexual powers well preserved, renders it important to do nothing to injure their manly vigor.

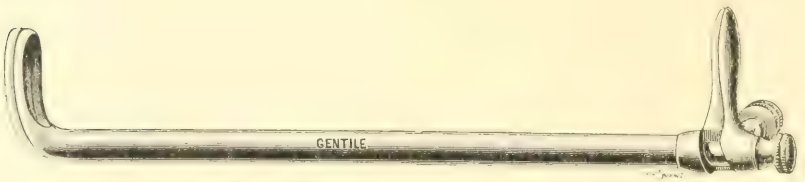


FIG. 2.—The prostatic "tractor" closed, ready for introduction.



FIG. 3.—The prostatic tractor opened out.

In a recent report, Petit[2] furnishes the results of a careful study of Albarran's cases of perineal prostatectomy. He was able to follow six cases who had had normal sexual powers before the operation. Of these, two, both under 60 years of age, have never been able to have erections since the operation. In two cases the erections are much enfeebled; two cases are as strong sexually as before operation.

The operation is performed by Albarran without respect to the ejaculatory ducts, the prostatic urethra being opened widely in the median line, and the lobes enucleated through this incision. It would seem that the ejaculatory ducts are almost certain to be injured or removed in this procedure.

[2] Petit: De la Prostatectomie Perinéale, Paris, 1902.

Petit mentions the work of other operators and concludes: "It seems to be shown that perineal prostatectomy diminishes if it does not suppress erections in some cases. But it is a curious fact that some cases operated on can still ejaculate." Another evidence of injury done to the ejaculatory ducts is that Petit reports that 12 cases in 30 suffered with epididymitis after the operation.

I know of no other statistics on these points. The three cases on whom I performed perineal prostatectomy by Alexander's method five years ago I have been unable to follow, and the twelve perineal prostatectomies which I have done in the past five months are too recent to draw final deductions from. Although the question needs further study, it is nevertheless evident that due attention should be paid, in performing the operation, to the importance of the prostate as a sexual organ.

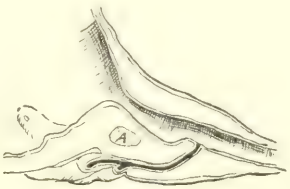


FIG. 4.—Longitudinal section of normal prostate. *A*, Prespermatic group of glands.

In order to determine the relation of the ejaculatory ducts to the urethra and the prostatic lobes, I have made transverse and longitudinal sections in the specimens both of normal and of hypertrophied prostate.

The accompanying illustrations show very graphically the course of the ejaculatory ducts in the normal state (Figs. 4 and 5). As seen here, if we trace them backward from their urethral orifices we find that they rapidly approach the posterior capsule of the prostate; that the tissue separating them from the urethra gradually increases, and that the point of junction of the seminal vesicle and vas is reached considerably in front of the junction of the prostate with the bladder. Stained sections of the posterior portion show a considerable agglomeration of the glandular tissue surrounded by encircling muscular and connective-tissue fibers which separate it more or less markedly from the glandular tissue of the adjoining lateral lobes. This mass of

glands has been called by Albarran[3] the prespermatic group, and this it is which is most concerned in the production of median lobe en-

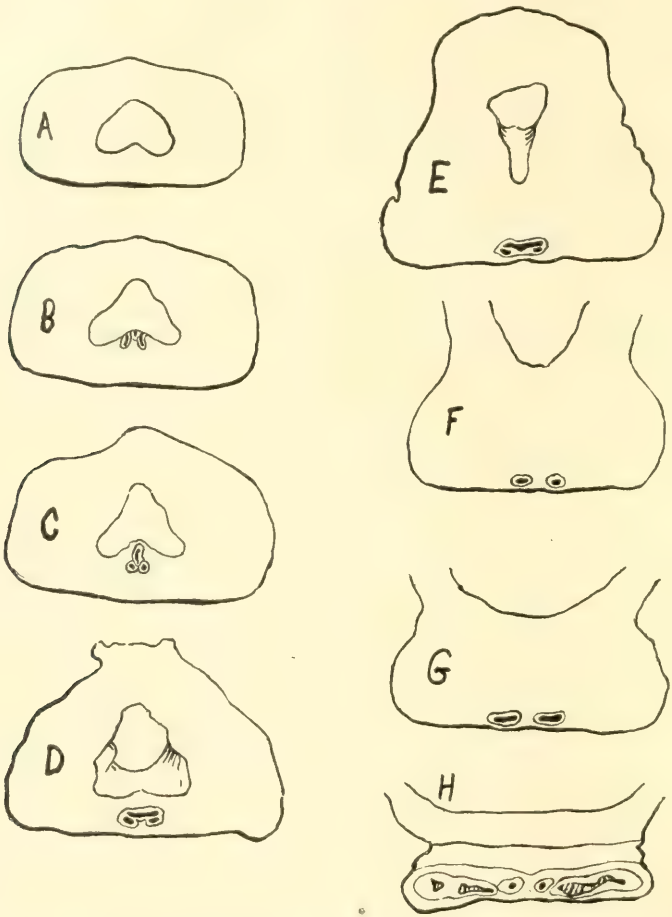


FIG. 5.—Cross section of normal prostate. *A*, At a point just in front of opening of ducts and utricle; *B*, at opening of utricle and ducts; *C* and *D*, 5-10 mm. back; *E*, at entrance into bladder; *G*, at the junction of seminal vesicles and ampullæ; *H*, the seminal vesicles and ampullæ separated.

largements. If this mass of glands (Fig. 6, *A*) is only slightly hypertrophied a median bar may be produced, which may be continuous with

[3] Albarran and Motz: Annales d. Mal. d. Organes Genito-Ur., July, 1902.

the lateral enlargements on each side, the whole forming a collar around the prostatic orifice. If, however, this group takes on considerable hypertrophy a sessile or pedunculated intravesical median lobe, sometimes of huge dimensions, results. In these latter varieties another group of glands which lie just beneath the mucosa where the trigone joins the urethra, and which Albarran has called the subcervical group, may take part in the hypertrophy. All these median enlargements grow upward, away from the ejaculatory ducts, from which they are separated by considerable tissue, including their encapsulating fibers.

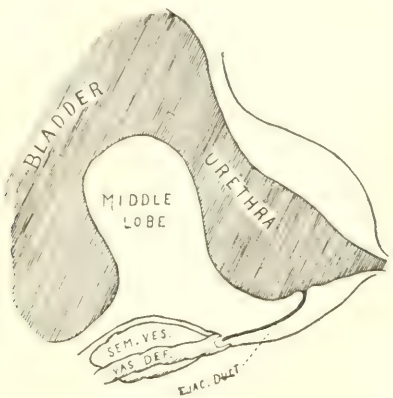


Fig. 6.—Longitudinal section of a prostate, with great hypertrophy of the median and lateral lobes. Urethra very wide and thin. Note low insertion of ducts.

In the hypertrophied prostate the position of the ejaculatory ducts and vesicles depends considerably on the character, size, and disposition of the enlargements. If the hypertrophy is great, and especially if a considerable median lobe is present, the vesical neck is generally found elevated far above the level of the ducts and vesicles, as shown in Fig. 6, which is a longitudinal section of a prostate in which the lateral and median lobes are all three greatly hypertrophied. The ducts enter so low down on the posterior surface of the prostate that the median lobe is not in relation to them at all, and is separated from the vesicles by the prostatic capsule. It would, therefore, be easy to enucleate this lobe without injuring the ducts at all if properly done. Note here also the great width of the urethra, the proximity of its

floor, and the sharp bend which it makes in front of the middle lobe. Cross-section *A* (Fig. 7) is taken where the utricle and one duct enter the urethra; *B* is taken a little further back and shows the ducts

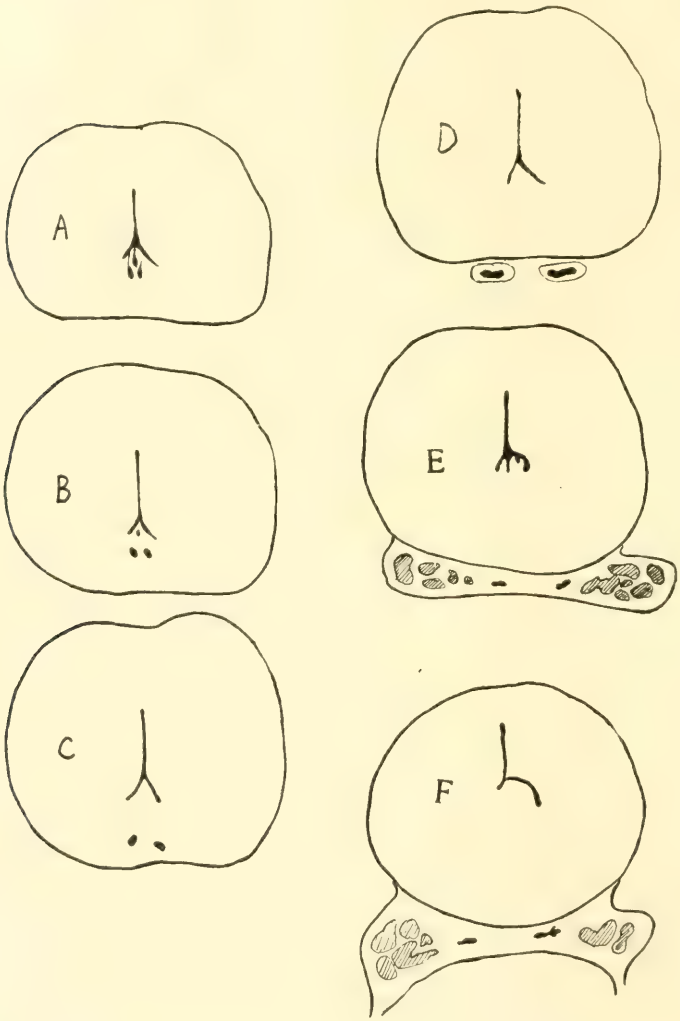


FIG. 7.—Six cross sections of the same prostate at different levels, as in Fig. 5. The ducts rapidly approach the posterior capsule and in *D* are already outside of it. *A* shows the beginning of the median lobe, and *F* just before the entrance of the urethra into the bladder.

midway between the posterior capsule and the urethra. Note the inverted Y urethra produced by the verumontanum below and the pressure of the lateral lobes against each other in front, and the slit-like character of the urethra. In *C* the ducts lie very close to the capsule.

Section *D*, which has been taken through about the middle of the prostatic mass, shows the junction of the vesicle and vas just outside the prostatic capsule. Note the greater distance of the urethral floor from the capsule. This is shown in still greater amount in *C*, and the vesicles and ampullæ are here seen to be separated from the median mass by the prostatic capsule. In *F*, which is taken about 5 mm. in front of the vesicle orifice of the prostate, the further elevation of the median lobe is shown. The full extent of the median lobe is shown in the median section (Fig. 6).

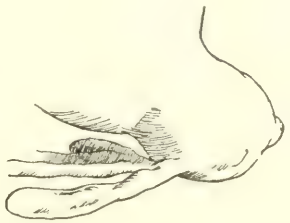


FIG. 8.—Side view of hypertrophied prostate, showing low entrance of ducts on posterior surface.

Figure 8 is a side view of another specimen in which the vesicles and vasa join the prostate low down on the posterior surface.

In cases of little or no median lobe enlargement the hypertrophied lateral lobes seem also to carry the vesical neck upward and leave the vasa behind, so that they are often found entering the capsule well down on its posterior surface, as depicted in Fig. 8, the side view of a specimen of considerable hypertrophy of the right lateral lobe. The aponeurosis of Denonvilliers, which is firmly attached to the posterior surface of the seminal vesicles and of the prostate below their entrance, and which binds the two together closely, may be responsible for the upward growth of the hypertrophied prostate and the resultant low insertion of the ducts into the posterior surface.

The results of this study of the course of the ejaculatory ducts may be thus summarized:

In the normal prostate the ejaculatory ducts lie for the most part just beneath the posterior capsule, considerably below the level of the vesical neck, and are separated from it by the prespermatic group of glands.

In the hypertrophied prostate the same statements are true, the only difference being that the ducts enter relatively lower down, and the vesical neck is separated from them by much more tissue, especially if the prespermatic group of glands have taken on growth with

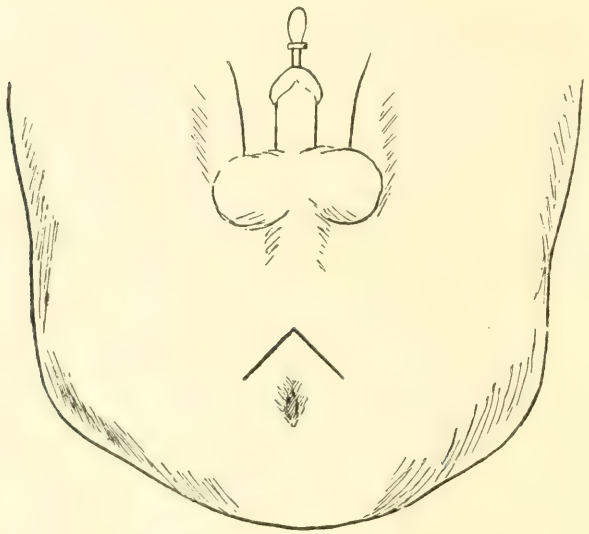


FIG. 9.—The inverted V cutaneous incision.

the resulting median lobe enlargement, in which case the vesical orifice is lifted high up above the level of the ducts. The prostatic tissue immediately adjacent to the ducts is beneath the urethra and plays no part in the obstruction, which is caused entirely by the lateral and median enlargements, both of which are well above the ejaculatory ducts.

The measures which I have adopted to preserve the integrity of the ejaculatory ducts and sexual puissance of the patient I will take up a little later.

TECHNIC OF THE OPERATION.

Position of the patient.—The exaggerated dorsal lithotomy position is the most satisfactory. The perineal board of the Halsted table is admirably suited for this purpose. The perineum should be so elevated that it is almost parallel with the floor. Before placing the patient on the table a No. 24F sound, to be used as a guide for subsequent urethrotomy, should be placed in the urethra, as it is difficult to introduce it after the thighs have been flexed.

Cutaneous incision.—I generally use an inverted V-shaped incision, as shown in Fig. 9. The apex is taken just over the posterior part of the bulb, and the two branches are each 5 cm. long, the posterior limits

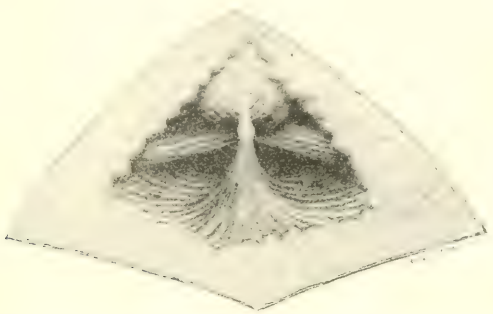


FIG. 10.—Exposure of bulb, central tendon and levatores ani.

being about midway between the anus and ischial tuberosities. This incision is carried through the skin fat and superficial fascia. The handle of the scalpel is then used on each side of the central tendon to open up the space back of the bulb and in front of the levator ani muscles as shown in Fig. 10. This blunt dissection should be carried well down behind the triangular ligament on each side, before sectioning any muscular structures. It is easily accomplished and a good exposure simplifies the next step in the operation.

Exposure of the membranous urethra.—After exposure of the central tendon by blunt dissection, the bifid retractor (Figs. 11 and 12) is inserted as shown in Fig. 13. Traction upon this instrument gives an excellent exposure of the narrow band of central muscle and greatly facilitates its division close to the bulb. Great care should be taken not to puncture the bulb—an accident which leads to inconvenient

hemorrhage. After the central tendon has been completely divided a retractor may be placed beneath the bulb, thus affording a better view of the recto-urethralis muscle, which lies beneath the two branches of

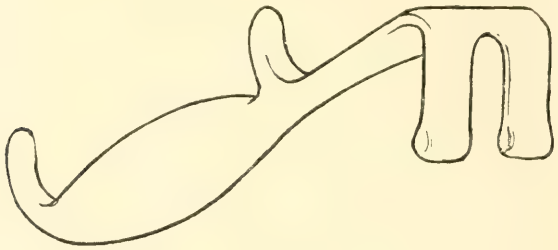


FIG. 11.—Bifid retractor.

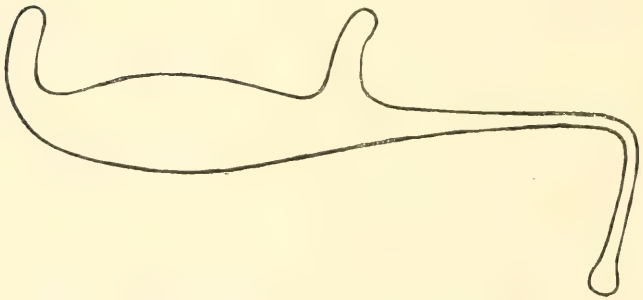


FIG. 12.—Bifid retractor. Side view.

the levator ani and covers the membranous urethra and the apex of the prostate in the median line.[4] The special retractor shown in Fig. 16a is well adapted for this purpose. The concavity in the middle

[4] The recto-urethralis is a short muscle with rather indefinite margins, which, as its name indicates, joins the rectum with the urethra. It is apparently responsible for the acute anterior flexure of the rectum which lies so close to the apex of the prostate and membranous urethra and which one finds in rectal examinations. In order to reach the membranous urethra and the apex of the prostate, it is necessary to divide this muscle, as shown in Fig. 13. This at once exposes the "espace decollable retro-prostatique" which has been so well described by Proust, who has shown that unless this muscle is divided the operator is apt to tear into the rectum, which is drawn forward by it. Division of this muscle allows the rectum to drop back, and leads at once into the space surrounding the posterior surface of the prostate.

allows it to partly encircle the urethra and catch the triangular ligament.

At this stage it is generally best to remove the "bifid retractor" and to insert a narrow-bladed retractor about two inches in depth, by which the rectum can be pushed back and the muscular fibers surrounding the membranous urethra—the recto-urethralis—put upon tension. They are then divided by a transverse incision close up to the triangular ligament and the membranous urethra exposed by blunt dissection.

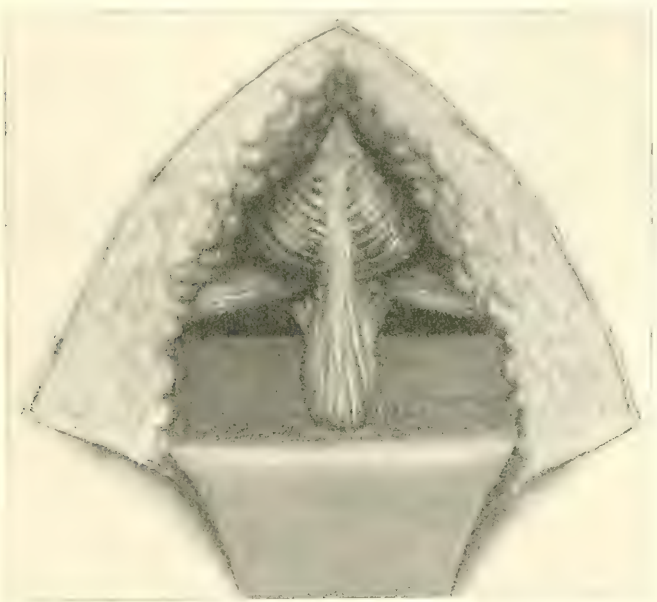


FIG. 13.—Showing bifid retractor, exposing and making tension on the central tendon.

Urethrotomy and insertion of tractor.—After the membranous urethra has been exposed by division of the recto-urethralis muscle a retractor is inserted and the apex of the prostate brought into view, as shown in Fig. 14. The membranous urethra is then opened on a sound (which was inserted in the urethra before the patient was put in the lithotomy position), and the edges of the urethral wound caught up by silk sutures or preferably by Halsted clamps. A

sound of moderate size is then passed through the incision into the prostatic urethra and bladder, and the sphincters dilated by a to-and-fro motion of this instrument. The prostatic tractor, closed (Fig. 2), is then passed into the bladder, the edges of the urethral wound being held open by the silk sutures to facilitate its introduction.[5]

As soon as the beak is free in the vesical cavity the thumb-screw

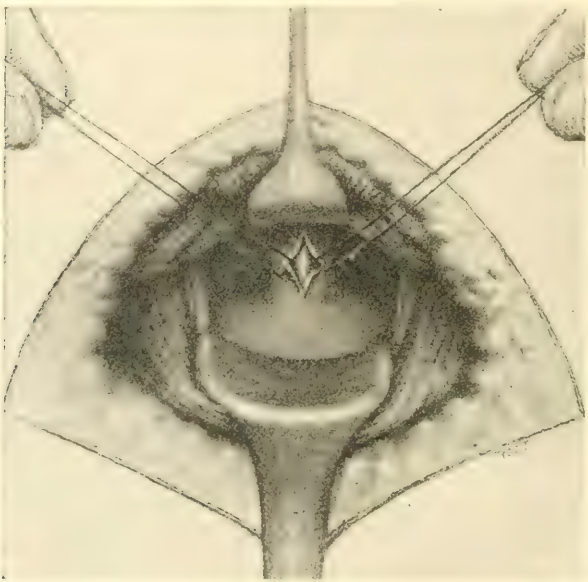


FIG. 14.—Opening of urethra on sound, preparatory to introduction of tractor.

which fixes the blades in position is loosened, the blades rotated 180 degrees by means of the external blades, and then fixed by tightening the thumb-screw (Fig. 3).

[5] Carelessness in this part of the operation may lead to considerable trouble. If the membranous urethra is not carefully exposed and thoroughly opened, difficulty may be experienced in picking up the edges of the mucosa of the urethra on each side. If the edges of the mucosa are not carefully secured with clamps and held apart, they may be inverted by the introduction of the tractor and the operation delayed until they can be picked up again.

The instrument is now ready for whatever traction may be necessary to draw the prostate well down into the perineal wound, as shown in Fig. 15. Fig. 16 shows the position of the blades in the interior

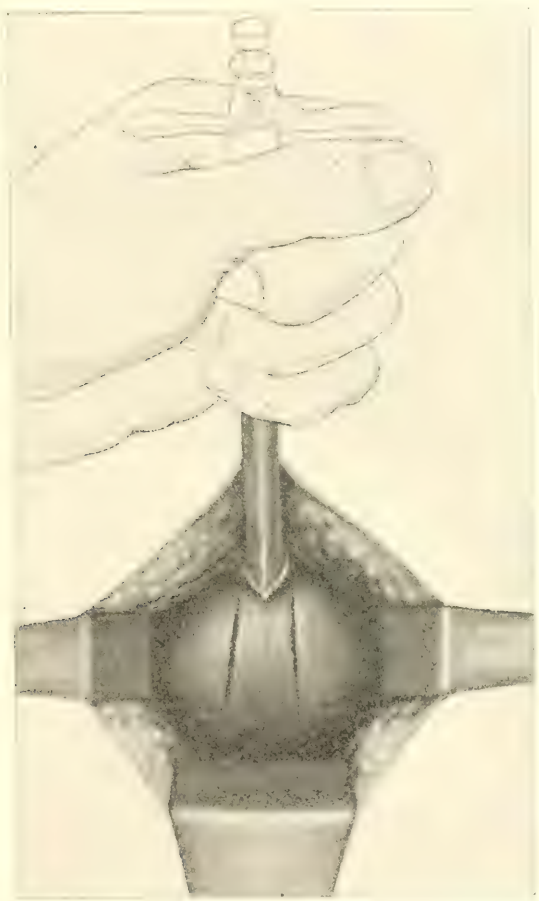


FIG. 15.—Tractor introduced; blades separated, traction made, exposing posterior surface of prostate. Incisions in capsule on each side of ejaculatory ducts.

of the bladder, each blade projecting laterally so as to engage the intravesical surface of the lateral lobe.

Exposure of prostate and incision of capsule.—Lateral retractors are so placed that with the posterior retractor (Fig. 17) drawing the rectum backward, and the prostatic tractor drawing the gland outward, a splendid exposure of the entire posterior surface of the prostate is obtained.[6]

These retractors should be especially made to suit the diameters of the space, as shown in Figs. 17 and 18. An incision is then made on each side of the median line for almost the entire length of the posterior surface of the prostate and about 1.5 cm. deep. The two lines are



FIG. 16.—Showing position of blades in interior of bladder in case of median and bilateral hypertrophy.

divergent, as shown in Fig. 15, being about 1.8 cm. behind and 1.5 cm. apart in front. The bridge of tissue which lies between them

[6] Even after the insertion of the tractor care must be taken in the further separation of the prostate and rectum, which is sometimes closely adherent along the entire posterior surface of the prostate. After the apex of the prostate has been thoroughly exposed so that the white capsule is plainly visible, the rest of the posterior surface of the prostate is freed by gradually pushing back the rectum with the handle of a scalpel, and dividing any muscular bands or fibrous adhesions which hinder the process of separation, but being careful to work against the prostate and not towards the rectum. The finger is particularly dangerous and nearly all the cases of rectal tear to which my attention has been called, have been produced by the finger in attempting to rapidly push back the rectum.

contains the ejaculatory ducts, and its preservation is of importance, if the integrity of these non-obstructive structures is to be left uninjured. It is for this purpose that I make the initial capsular incision 1.5 cm. deep on each side, and these define at once, and correctly, the

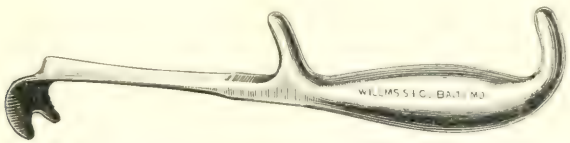


Fig. 16*a*.—Anterior retractor for drawing forward bulb and transverse perineal muscles to expose the membranous urethra.

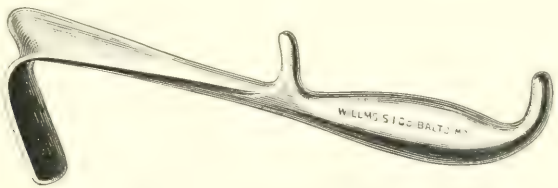


Fig. 17.—Posterior retractor.

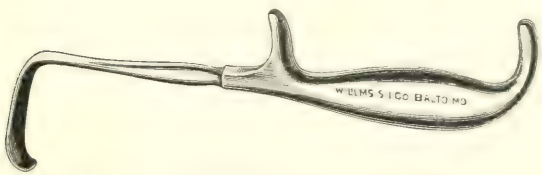


Fig. 18.—One of the lateral retractors.



Fig. 19.—Blunt dissector or enucleator.

width of the "ejaculatory bridge," and prevent its being torn, as might happen if we depended on blunt dissection. Another advantage is that these incisions bring us at once to the side of the urethra where the internal enucleation (urethra from inner surface of lobe) can be easily accomplished later on.

Enucleation of lateral lobes.—We are now ready to begin the external enucleation, the separation of the capsule from the lateral lobes, which is best done with the blunt dissector, as shown in Figs. 19 and 20. Capsules are of varying thickness, and contain several layers of cleavage. It is important to start the separation in the right layer, not too deep as you may be led into the substance of the lobe, and not so superficially as to be outside of the most of the capsule. After the

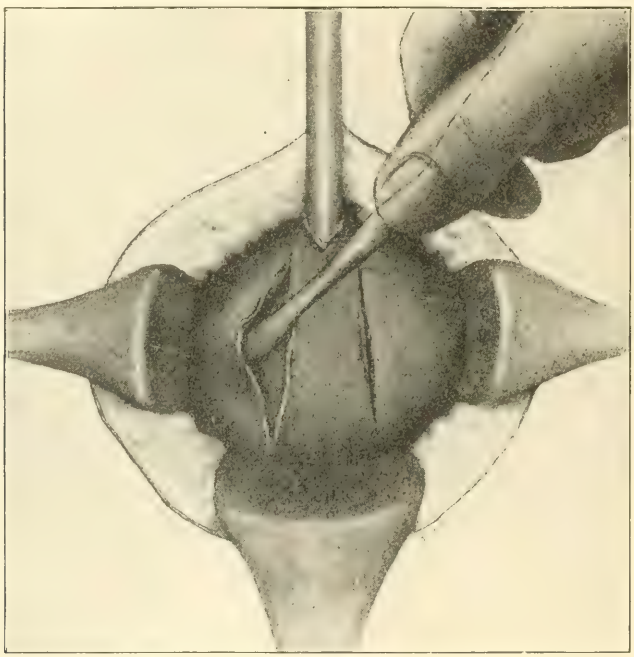


FIG. 20.—External enucleation begun.

stripping up process has been started correctly it is easily continued by blunt dissectors until first the lateral and then the anterior surface of the lateral lobes have been freed from the capsule.

The internal enucleation should be taken up after the external, as it is a much more delicate procedure and often requires considerable care to prevent tearing into the urethra. As remarked above, the primary incision is made with the scalpel until past the level of the urethra after which the blunt dissector is used. During this procedure the shaft of the prostatic tractor is grasped firmly in the operator's

left hand (Fig. 15) and serves not only to draw the prostate so well down into the cutaneous wound that every procedure is done in plain view, but to steady the prostate and to mark out the course of the urethra so that it can be avoided. At the apex of each lateral lobe firm adhesions to the capsule, usually requiring divisions with scissors, are nearly always present.

When the enucleation of a lateral lobe has progressed fairly well on each side, it is advantageous to have traction made on the lobe itself in order to facilitate the separation of the deeper portion. I tried various instruments—vulsellum forceps, pedicle forceps, and hook

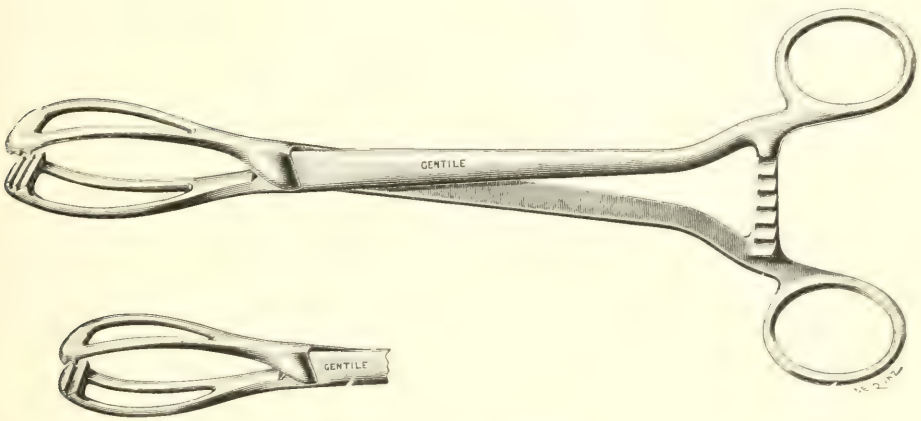


FIG. 21.—Lobe forceps.

retractors—for this purpose, but I found that all toothed instruments quickly tore through the friable tissue whenever traction sufficient to be of any assistance in drawing out the lobe was used. It, therefore, seemed advisable to have fenestrated forceps which could grasp the entire lobe, and present such broad surfaces to it that no cutting or tearing of the capsule would be done. I accordingly designed the instruments shown in Fig. 21. The two blades grasp the prostate with broad surfaces, so shaped as to hold, but not to cut the lobe when pressure is applied (Fig. 22).

The lobes usually come out each in one piece, and it is possible to apply considerable traction without tearing them, thus greatly facilitating the deeper enucleation. Much of the enucleation is done

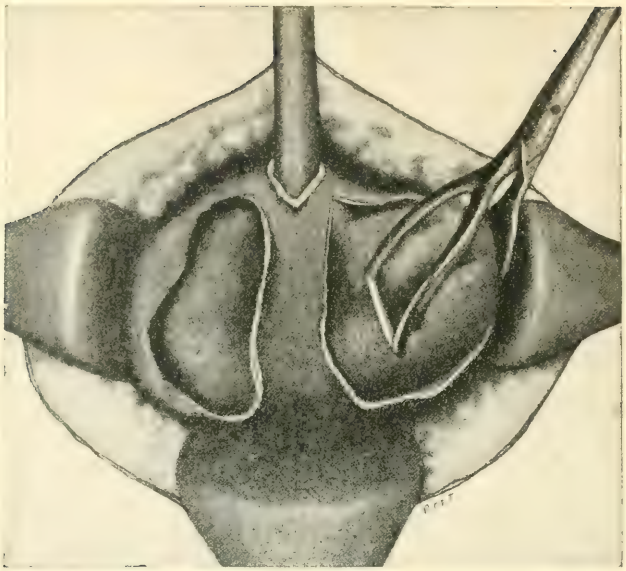


FIG. 22.—Enucleation of lobes. Forceps in position.

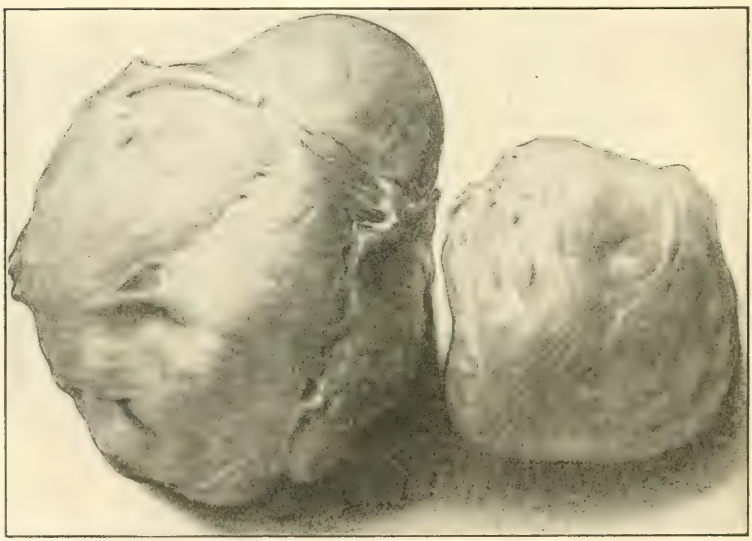


FIG. 22a.—Two lobes removed by perineal prostatectomy. Actual size.

with the blunt dissector, but when the intravesical portion of the lateral lobe is reached I generally use the finger so as to avoid tearing through the thin mucous membrane covering it.

The intravesical blade of the prostatic tractor, which can be distinctly palpated through the mucous membrane by the enucleating finger, serves to direct the separation of the deeper portion, and warns against tearing into the bladder. It also shows when some of the lobe has been left behind. The condition present after the enucleation of the two lateral lobes, as described above, are shown in Fig. 23.

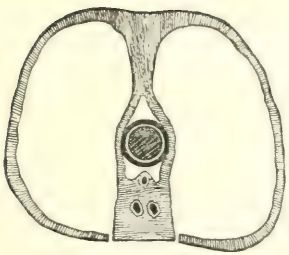


Fig. 23.

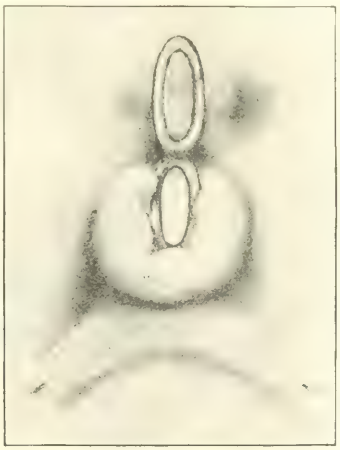


Fig. 24.

Fig. 23.—Schematic cross section after enucleation of lateral lobes, showing ducts and median bridge of tissue. Instrument in urethra.
Fig. 24.—The blade rotated so as to engage middle lobe.

As shown in this schematic cross-section, the urethra, which contains the tractor, is left intact. Beneath is the bridge of tissue surrounding the ejaculatory ducts. The empty capsule is shown on each side.

Enucleation of the middle lobe.—After the lateral lobes have been shelled out, attention should be directed to the median portion of the prostate. If the previous cystoscopic examination has demonstrated a thin transverse bar, it will sometimes be found that removal of the lateral lobes has allowed it to collapse, showing that it was really an artefact, a fold of mucous membrane hooked up by the lateral outgrowths, and not containing any hypertrophied tissue.

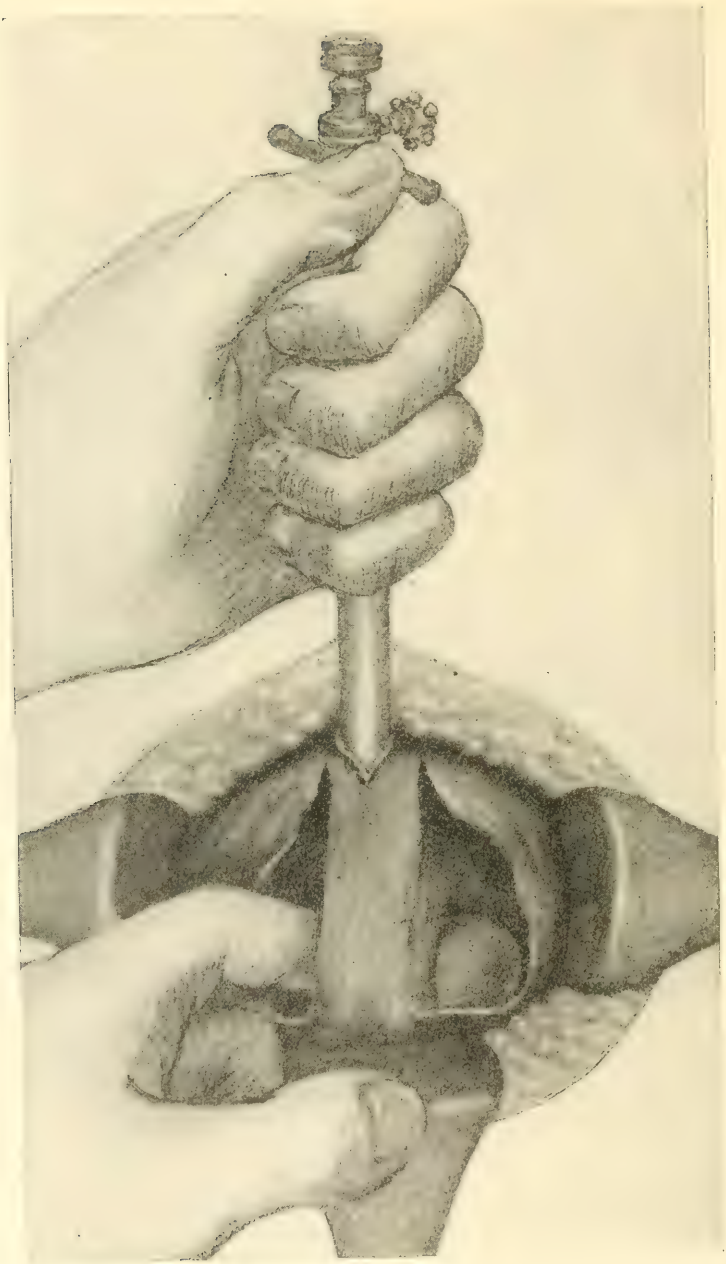


FIG. 25.—Showing technique of delivery of middle lobe into cavity of left lateral lobe.

On the other hand, there is most often a more or less extensive hypertrophy of the prespermatic group of glands, and the mass can be easily seen, or felt by the finger in one of the intracapsular cavities (Fig. 25). Further examination will generally reveal a fair amount of tissue between the median lobe and the region of the ejaculatory ducts, which, as I have previously pointed out, lie well forward on the posterior surface, and close to the capsule. The median enlargement is generally more or less definitely attached to one or both of the lateral lobes so that there is no difficulty in shelling it out through

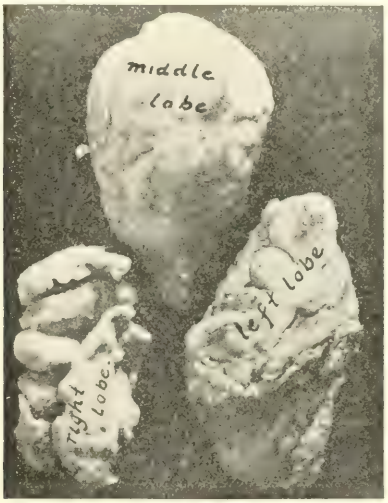


FIG. 25a.—Photograph of a pedunculated median lobe which was removed through the cavity left by left lateral lobe without tearing urethral or vesical mucosa. The three lobes are shown in exact size.

one of the lateral cavities—without disturbing the integrity of the ejaculatory ducts and prostatic tissue immediately surrounding them.

The prostatic tractor may be used with great advantage in removing a median lobe, and the technique which I generally employ to draw it down into one of the lateral cavities where it can be enucleated, is as follows: Push the tractor backward until free in the bladder cavity, depress the handle of the instrument so that the shaft can lie on the top of the middle lobe, and then rotate the instrument 90 degrees, so that one of the blades projects downward behind it. Out-

ward traction should then engage the lobe, as shown in Fig. 24, and drawn down where it can be seen by the operator. To get it into one lateral intracapsular cavity (say to the left) two manœuvres are of help: Pushing against it with the index finger of the left hand, which has been inserted in the right intracapsular cavity, as seen in Fig. 25, and rotation of the blade engaging the middle lobe in the same direction, making traction on it all the while. Fig. 25*a* shows a pedunculated



Fig. 26.

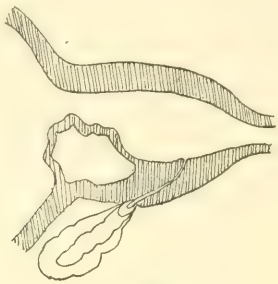


Fig. 27.

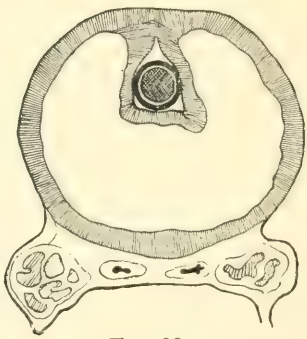


Fig. 28.

Fig. 26.—Photograph of prostate in which the left and median lobes were enucleated in one piece. Exact size.

Fig. 27.—Longitudinal section after enucleation of median lobe through a lateral cavity.

Fig. 28.—Cross section at level of cavity left by median lobe.

median lobe that was removed in this way without injury of the mucosa covering it (Case No. 12).

After the median lobe has presented in the left intracapsular cavity, the operator turns the tractor over to an assistant who continues the traction, while he grasps the lobe with the forceps described above and then rapidly enucleates it.

In many instances I have found the median mass to be directly continuous with the left lateral lobe, and when the deeper portion of that lobe was being freed, that the median lobe was disposed to come with it. I have then rotated my tractor so as to engage the median, and have readily drawn it down and enucleated the two in one piece, as shown in Fig. 26. In another case a collar-like growth, consisting of a median bar and two lateral masses, was easily enucleated in entirety through the left intracapsular cavity without tearing the ducts beneath or the mucous membrane of the urethra or bladder.

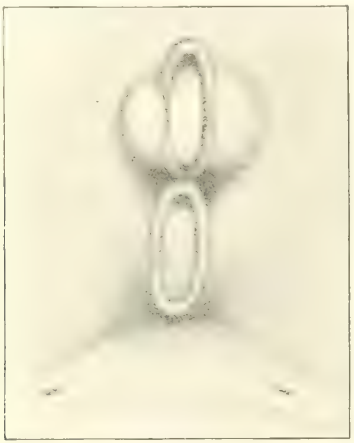


FIG. 29.—Blade engaging anterior lobe.

I have now had many cases with very great intravesical median lobes, and have experienced little difficulty in drawing these down with the tractor into a lateral cavity where enucleation was easily accomplished. A large median lobe is no longer considered more suitable for suprapubic prostatectomy.

The condition present after the enucleation of a median lobe, as described above, is shown schematically in Figs. 27 and 28. Fig. 27 is a longitudinal section showing the cavity left by removal of this lobe, the ejaculatory ducts being below and in front and quite distant from it. In Fig. 28 the median cavity is seen to communicate with the lateral cavities on each side, beneath the intact urethra. The seminal ducts are separated from the capsule by the posterior capsule.

The removal of an anterior lobe.—The presence of a definite isolated

anterior lobe is of rare occurrence. We occasionally see with the cystoscope small anterior outgrowths, but they are generally continuous with a lateral lobe.

One of my cases was of this character, and, although it looked through the cystoscope like a large rounded mass, I found that it came away easily with the lateral lobe. I employed a procedure the reverse of that which I have just described for posterior middle lobes, the

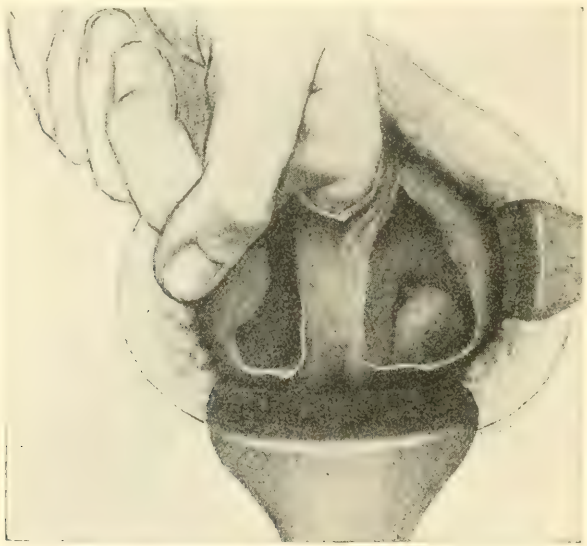


FIG. 30.—The use of index finger to deliver a small median lobe into lateral cavity.

anterior lobe being engaged by a blade which was directed upward, as shown in Fig. 29. The entire mass (left lateral and anterior lobe) was very large, measuring 7 x 6 x 5 cm.

In another case a large detached anterior lobe was easily drawn down and enucleated through the right lateral cavity.

The ability to make traction on any desired portion of the prostate is of the very greatest value and assistance, especially in enucleating these unusual outgrowths of the hypertrophied gland.

THE USE OF THE INDEX FINGER AS A RETRACTOR.

There are some cases, however, in which the median enlargement is in the shape of a small bar or lobe, so adherent that it is difficult to engage it with the blade of the tractor, as described in my first paper, and for these I have of late employed the index finger of the left hand in place of the tractor in the urethra, to push the lobe into the lateral cavity. After the tractor has been withdrawn the left index finger is inserted gently through the prostatic urethra, until the tip is free in the bladder. Examination will then reveal the median bar or lobe which remains, and it is an easy matter, by crooking the finger over it, to carry it into the left lateral cavity where it can be enucleated (Fig. 30). If an adherent bar is encountered a sharp periosteal elevator is a good instrument with which to peel it out. Occasionally it may be necessary to use scissors for this purpose, and to get hold of the mass to be removed as it begins to be separated, a long forceps may be required.

In several of my cases it has been impossible to engage with the blade of the tractor a very small rounded or pedunculated median lobe, but I have been able, by using the finger instead of the tractor, to successfully remove it without injuring the urethra or the ejaculatory ducts. The technique described above is entirely different from that of Albarran, who draws the median lobe into the widely opened urethra with the finger.[7]

A very pedunculated middle lobe may evade both the finger and the tractor, and in such instances it may be best to insert a curved clamp and draw the middle lobe down the dilated urethra where it may be enucleated or divided with scissors. This is the technique employed by Albarran.

A SUBURETHRAL METHOD OF REMOVING A MEDIAN BAR OR LOBE.

In case the patient has already lost his sexual powers the reason for preserving the ejaculatory ducts does not hold, and in such cases, when the median bar or lobe is too small or too adherent to be deliv-

[7] Albarran's technique may sometimes be of value in cases of pedunculated middle lobes of small size. I have used it several times, but usually considerable laceration of the urethra has been produced and there is more hemorrhage than with my technique in which the mucous membrane is not removed.

ered into a lateral cavity with the tractor, I have removed the mass suburethrally, after transverse division of the ejaculatory bridge, as shown in Fig. 31.

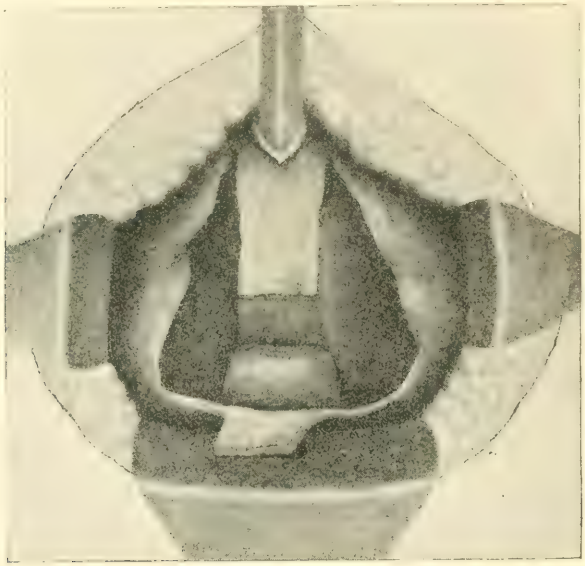


FIG. 31.—Showing suburethral method of enucleating median bar.

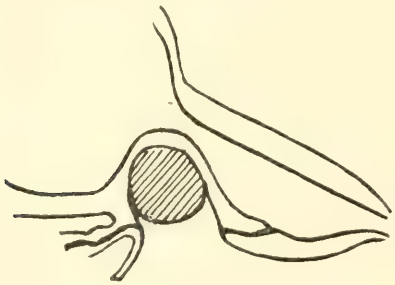


FIG. 32.—Schematic longitudinal section of the urethra, showing the median enlargement enucleated beneath the urethra.

After stripping back the capsule (Fig. 32) it is an easy matter to shell out or to excise the median bar or lobe without opening the urethral or vesical mucous membrane covering it.

Fig. 33 shows a small median bar which was removed in this way after the enucleation of two large lateral lobes. The patient had been castrated and there was therefore no object to be gained by preserving the ejaculatory ducts. (Case 25.)

In some cases in which it is desirable to preserve the ejaculatory ducts, a fibrous median bar may be removed through one of the lateral cavities of the prostate, after division of one of the lateral walls of the urethra, as shown in Fig. 34. In this way the "ejaculatory

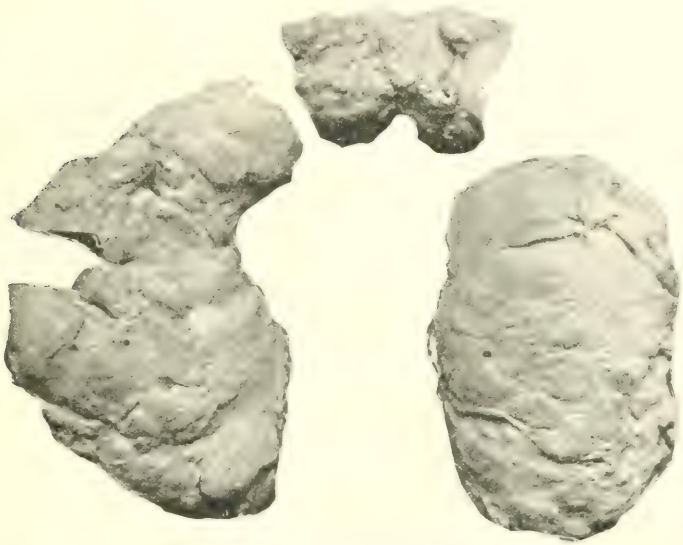


FIG. 33.—Photograph, natural size.

bridge" is preserved. This method has been employed in several cases.

In the great majority of cases the median mass can be enucleated through the lateral cavity—the larger the lobe the easier it is.

TREATMENT OF VESICAL CALCULUS AS A COMPLICATION OF ENLARGED PROSTATE.

When calculus is present, either litholapaxy, before or during the prostatectomy operation, or suprapubic or perineal lithotomy may be performed. Without going into arguments for or against either of these procedures, it is evident that if a perineal prostatectomy is to

be performed the ideal procedure is to remove the calculus at the same sitting, without crushing it, for litholapaxy is in these cases a tedious procedure. If, however, the removal of the calculus intact will seriously injure the urethra, the ejaculatory ducts or the neck of the bladder, such a method is contraindicated. To drag a calculus by main force out through the urethra, as left by the technique

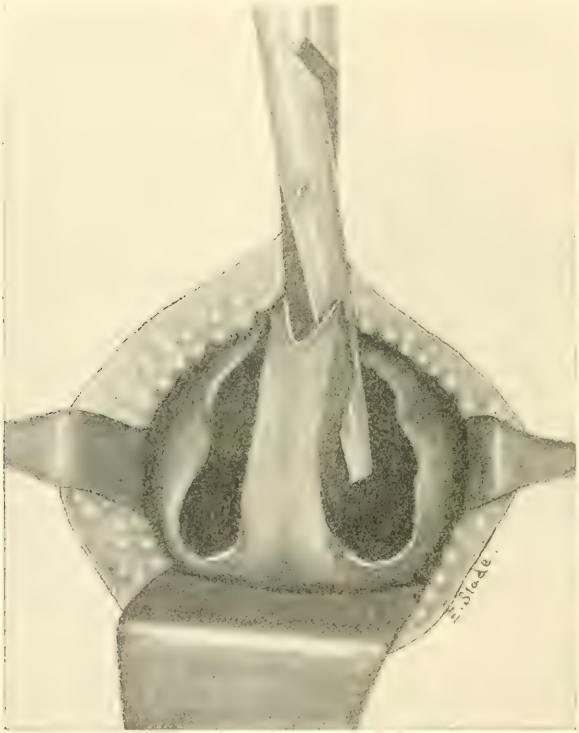


FIG. 34.—Division of lateral wall of urethra to allow extraction of large calculus through left lateral cavity.

which I follow, would be at once dangerous and destructive, except when it is small.

I have therefore endeavored to devise a method which would be free from the dangers mentioned above, and which would also provide for the removal of large stones. The technique which I have found most satisfactory is graphically shown in the accompanying drawing (Fig. 34).

As seen here, the urethra is split with scissors along its left lateral wall, from the urethrotomy wound in the membranous urethra up to its vesical orifice. By this procedure, the urethra becomes a common cavity with that left by the enucleation of the left lateral lobe, and abundant room is furnished for the extraction of calculi. If the cystoscope has shown the calculus to be only moderately large it is usually only necessary to dilate the vesical orifice with a uterine dilator in order to extract it with forceps. If the calculus is too large to be thus withdrawn, the orifice is enlarged by a cut through the vesical mucous membrane covering the left lateral cavity of the prostate, while the stone is held firmly against it by forceps.

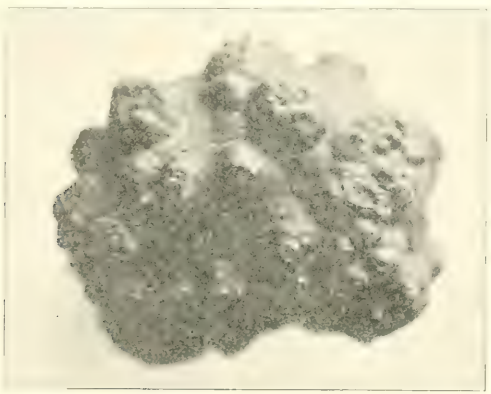


Fig. 35.—Exact size of calculus removed through perineal incision.

I have followed the technique described above in 24 cases of calculus which are described in full in another part of this paper. Fig. 35 shows the calculus which was removed by this method in one case.

The ejaculatory bridge containing the ducts is not injured, no urethral nor vesical mucous membrane is removed, and the perineal wound heals just as rapidly as after the simple prostatectomy; in one case, perineal leakage ceased after the ninth day. I have not found it necessary to close the divided urethra with sutures, but have simply provided the double urethral catheter drainage through the urethrotomy wound and the gauze packing for the lateral cavities as usual. The great advantage of perineal over suprapubic lithotomy is that the patient can be propped up in bed at once, and moved into a wheel-chair on the

third or fourth day. The secret of success in these cases, is to flush the kidneys and to get the patients out of bed quickly, and this cannot be done after the suprapubic operation with the same impunity and rapidly as in the perineal cases. In some cases sectio alta may be necessary, though an attempt to crush the stone through the perineal wound may be a decided one. A very careful search should be made for additional calculi. If much blood has been collected in the bladder it is often advisable to evacuate it and wash out the bladder thoroughly before continuing the search. "Recurrent calculi" after prostatectomy are usually calculi or fragments of calculi left behind at operation.

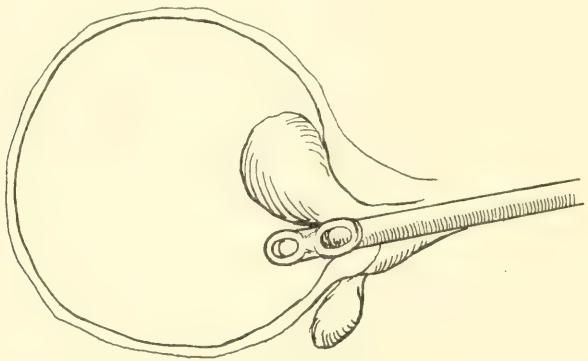


FIG. 36.—Showing how the tractor may slip beneath prominent lateral lobes.

Searching for undetected intravesical lobes.—The median and the two lateral lobes should generally be completely removed each in one piece. If the cystoscope has shown any peculiar intravesical outgrowth, an effort should be made to remove it with the lobe to which it is attached by engaging it with the tractor. In order to secure it, several successive attempts may be necessary. By palpating the entire prostatic margin with a finger in a lateral cavity against the blade of the tractor a lobule which has been left behind can usually be discovered.

When there is no median bar or lobe to hold up the intravesical portion of the prostatic tractor, the blades may slip beneath prominent intravesical lateral outgrowths, as shown in Fig. 36. This happened in one of my early cases and is the cause of an imperfect result. Ro-

tation of the tractor and palpation with the finger, as described above, should prevent such an oversight. In rare instances it may be necessary to use the index finger in the urethra in place of the tractor, particularly in small pedunculated middle lobe cases, as described above. Whenever one fails to find what has been shown by the cystoscope the digital exploration should be employed. The only objection to it is that the urethra is usually split open by the procedure.

Drainage.—Before withdrawing the tractor a careful examination should be made by inserting the finger into both of the lateral cavities

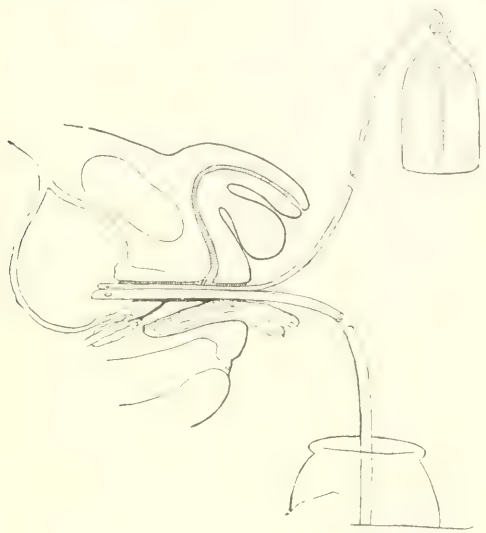


FIG. 37.—Scheme of continuous irrigation apparatus.

and palpating the blades through the vesical mucosa, in order to determine that no important glandular mass has been left behind. The tractor is then removed by first rotating the blades until they come together and then withdrawing the instrument. Abundant vesical drainage should be provided, as a small tube may easily become plugged by blood-clots and give great annoyance afterwards.

I now use two catheters of fairly good size. These are fastened together by ligatures and are prepared before the operation, so that as soon as the tractor is withdrawn they can be inserted through the perineal wound into the urethra and bladder. In order to facilitate their introduction it is best to cut obliquely across the end of each

catheter and then fasten the cut surfaces together with a single suture, thus making a common point for the two catheters. If this is not done one of the catheter ends may catch in a fold of mucous membrane. One catheter is immediately connected with a tank of normal salt solution, and the bladder thoroughly washed clean of blood.

After the tubes have been properly adjusted, they are tied by a

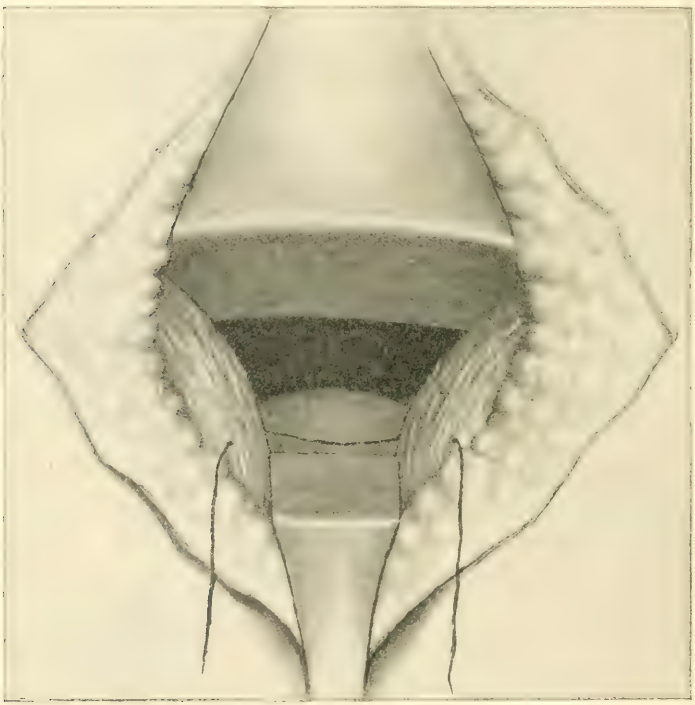


FIG. 38.—Approximation of levator ani muscles with single suture of catgut.

heavy silk suture to the skin at the upper angle of the wound. The lateral prostatic cavities are then firmly packed each with a small strip of gauze, but care is taken that the packing is confined to the lateral cavities of the prostate and especially that none may be allowed to press against the rectum. The tube and gauze drainage as thus provided is shown in Fig. 37.

Approximation of the levator ani muscles.—Before closing the cu-

taneous wound one should always examine the rectum. With a gloved finger inserted through the anus and another in the wound the rectal wall should be carefully examined for lacerations or weaknesses. During this procedure it is well to hold the gauze packing and tubes out of the way by means of anterior retraction (Fig. 38).

The rectal wall above the anal sphincter is usually found quite thin even in cases where no injury has been done to it, and in cases where it has been very adherent to the prostate the musculosa may be somewhat torn and should be drawn together with a suture or two of fine catgut. If a definite tear into the rectal cavity should be found (and this occurred four times with me, two being in cases with large operative cicatrices between rectum and prostate) careful closure should be made first with a layer of interrupted very fine silk sutures for the submucosa, then one for the musculosa, and finally a reinforcing layer of catgut sutures. No trouble should be experienced in effecting a solid closure if the proper needles (very fine curved patent-eye needles) are at hand.

After satisfying yourself that the rectum is uninjured the levator ani muscles should be drawn together to their normal position in front of the rectum. This can be accomplished with a single suture of heavy catgut, as shown in Fig. 38. It is remarkable what a difference this one suture will make. Before its insertion the levators will be found widely separated (by the traction which has been made against them) and the thin rectal wall will be found bulging between them, as shown in Fig. 38. It is then easy to understand how rectal fistulæ occur, for if great force were put on the thin unsupported rectum (as at stool) it might easily give way, and if a gauze pack were allowed to press against it, necrosis might quickly result.

When the levator suture is placed, the picture changes immediately, the rectum disappears behind the firm buttress of reapproximated levators and the danger of rectal breakdown vanishes.

Partial closure of the wound.—If the median perineal incision has been used, the posterior portion is closed by buried catgut for the muscle, and silk or catgut interrupted for the skin. While no important muscles have been divided (only the central tendon and the recto-urethralis muscle), it is nevertheless advisable to draw together the structures which have been so widely separated by retraction.

If the inverted V-incision has been employed the two branches of

the incision are partly closed, as shown in Fig. 39, leaving a small area in front of the gauze and tube drains.

Using this method of closure there is no more distortion of the perineum after this incision than after the median, and there should not be, as there is no more destruction of muscular continuity in one than in the other; in fact, they only differ in the cutaneous incision.

After-treatment.—The patient is generally returned to his room accompanied by an assistant who sees that the irrigation is going well, and arranges to have it continued after he has been placed in bed. The apparatus used is indicated in Fig. 37, but a much larger tank is employed. We now use a two-gallon porcelain tank with an outlet at the side. The flow is regulated by a clamp on the

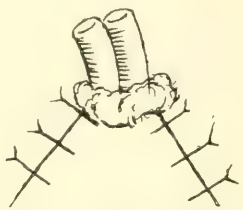


Fig. 39.—Final closure.

inlet tube. The outlet tube drains into a jar by the side of the bed. If the end is kept immersed in water, air cannot get up the tube, and siphonage is obtained, thus keeping the bladder empty and preventing leakage around the perineal tubes. The task of keeping the reservoir supplied with salt solution is not a difficult one, the nurse having to add a quart about every half hour. It is not necessary to maintain an even temperature—110° to 120° F. in the tank is about right—and the temperature is maintained between these fairly well by the half-hourly addition of the hot salt solution.

A submammary infusion of 1000 cc. salt solution is given either on the operating table or after the return to bed. This is considered so valuable, both as a preventative to shock and anuria, and as a cure for post-operative thirst, that it is never omitted.

The gauze drains are removed on the day after the operation and no more packing put in. The tubes are pulled out a few hours later, and on the next day the patient is usually placed in a wheel-chair, and carried out-doors. No sounds are passed and stricture never

results. Urotropin is administered early, and water is given in abundance (by infusion every two or three days if advisable).

Within a few days the patient is generally walking about the hospital. Nothing is done to the wound except to keep it clean, and to occasionally cauterize exuberant granulations.

I may say that the instrument which I have called "prostatic tractor" has transformed, for me, the operation of prostatectomy. Where before (with me—perhaps not with others) an operation was done somewhat haphazard, depending largely on the sense of touch, and in the dark; now the entire operation is performed in a shallow wound, accurately under visual control, proper regard being paid to the urethra and to the ejaculatory ducts.

III. An Analysis of 145 Cases of Perineal Prostatectomy for Hypertrophy of the Prostate in which the Operation Described Above has been Employed.

A. The onset of the disease. Etiology.

The ages of the patients were as follows:

35	to	39	.....	1
40	"	44	.....	0
45	"	49	.....	3
50	"	54	.....	9
55	"	59	.....	20
60	"	64	.....	29
65	"	69	.....	38
70	"	74	.....	24
75	"	79	.....	16
80	"	84	.....	4
85	"	90	.....	1
			Total	145

A glance at this table shows that prostatic enlargement and obstruction occur most frequently in the five years between the ages of 65 and 69 inclusive, there being 37, or 26% of the cases during that period of life. The decennium 60 to 69 contains 66 cases, or 46%. The 15 years between 60 and 74 contains 90 cases, or 62%, and the 25 years between 55 and 79 contains 126 cases, 87%. There are only 13 cases under 55 years of age and five cases over 80 years of age.

The cases under 55 years of age were briefly as follows, between 35 and 39 years of age, one case:

No. 137, age 37, had never had gonorrhœa, had suffered with difficulty and frequency of micturition for many years. The prostate was not enlarged, but there was a small median bar and 440 cc. residual urine. Microscopically, chronic prostatitis.

Forty-five to 49 years of age, three cases:

No. 37, age 47. History of gonorrhœa and stricture, calculus, duration 12 years. Catheter life two years. Small median bar, microscopically, chronic prostatitis.

No. 8, age 45 years. No history of gonorrhœa. Urinary difficulty and frequency for two years, occasional complete retention of urine. Prostate not enlarged, small fibrous median bar. Microscopically, chronic prostatitis.

No. 133, age 47. No history of gonorrhœa. Frequency of urination for 10 years. Complete retention of urine two years ago. Residual urine 360 cc. Prostate not enlarged, soft, small median bar. Microscopically, chronic prostatitis.

Fifty to 54 years of age, 9 cases:

No. 90, age 50. Gonorrhœa. Difficulty of urination 10 years. Occasional complete retention. Prostate very little enlarged, small round pedunculated median lobe. Microscopically, glandular hypertrophy with prostatitis.

No. 61, age 50. No gonorrhœa. Duration of urinary symptoms eight years. Recent complete retention of urine. Prostate slightly enlarged, a small median lobe. Microscopically, glandular hypertrophy and prostatitis.

No. 102, age 52. No gonorrhœa. Urinary frequency and pain for seven years. Catheter life five months. Prostate slightly enlarged, small median bar. Microscopically, chronic prostatitis.

No. 143, age 52. History of gonorrhœa. Frequency of urination and pain for one and one-half years. Prostate slightly enlarged, small median bar, large vesical diverticulum. Microscopically, chronic prostatitis.

No. 89, age 53. History of gonorrhœa and severe stricture for 30 years. Great frequency, difficulty and pain. Contracted bladder, vesical ulcer. Extensive stricture of deep urethra. Small hard prostate, slight median bar. Microscopically, chronic prostatitis.

No. 66, age 54. Gonorrhœa. Urinary difficulty and frequency for several years, previous suprapubic lithotomy. Residual urine 200 cc. Slight enlargement of prostate, small median bar. Microscopically, fibro muscular hypertrophy.

No. 17, age 54. No history of gonorrhœa. Difficulty and frequency of urination 15 years. Residual 500 cc. Prostate slightly enlarged, small pedunculated median lobe. Residual 500 cc. Microscopically, glandular hypertrophy with chronic prostatitis.

No. 19, age 54. No history of gonorrhœa. Intermittent severe hematuria one year. No difficulty or frequency of urination. Residual urine 220 cc. Considerable hypertrophy of lateral and median lobe. Microscopically glandular hypertrophy.

No. 82, age 54. Gonorrhœa followed by stricture, complete retention of urine, catheter life for eight years. Small hard prostate, multiple vesical diverticula, severe fibrous stricture of the deep urethra, small median prostatic bar. Microscopically, fibro muscular hypertrophy, chronic prostatitis.

In the four cases younger than 50 years of age there was no evidence of glandular proliferation or enlargement, and the obstruction was entirely due to a chronic inflammatory process which had transformed the median portion into a bar, which although small in amount caused very serious obstruction. In the nine cases, between the ages of 50 and 54, all but one showed evidence of chronic inflammatory changes, and in three there was slight evidence of glandular proliferation and hypertrophy. In one case only was the prostate greatly enlarged, and in this case there was considerable hypertrophy of the lateral lobes and a large pedunculated median lobe, all three showing microscopically a pure glandular hypertrophy. It is interesting to note that in this case there was no urinary disturbance, the only complaint being a frequent profuse hematuria. The symptoms presented were nothing like so severe as with the small inflammatory prostates which have been mentioned above.

A review of these cases shows conclusively that chronic prostatitis may lead to severe obstructive symptoms, large residual urine, multiple vesical diverticula, complete retention of urine, pain and great discomfort, without the presence of any definite hypertrophy of the prostate.

In five cases only was there a history of gonorrhœa, and in three of these stricture of the urethra was present, in two of very severe character requiring external urethrotomy and excision when prostatectomy was performed.

In all of the 13 cases there was urgent need for the operation, and the splendid results which have been obtained justify the procedures undertaken.

The urine was infected and contained pus and bacteria, generally bacilli in 11 of the 12 cases under 55 years of age. All of these 11 cases showed chronic prostatitis. The one case in which the urine was sterile showed considerable glandular hypertrophy and no prostatitis.

The cases over 80 years of age were five in number, viz., 80, 81, 82, 82, 87. In three cases symptoms of obstruction had only been present for three years although in two of these the prostatic enlargement was

considerable. In one case (patient age 82) there had been symptoms of prostatic obstruction for 24 years and the prostate was so huge that it could be felt suprapubically where it was palpable as a hypogastric tumor four inches in diameter. The tissue removed weighed 240-G. and the patient is now well, two and a half years after the operation, and is 85 years old. In the fifth case symptoms had been present for 10 years and had been characterized by attacks of complete retention of urine which came but seldom, the rest of the time there being little disturbance.

Marital State.—One hundred and eleven were married, 19 widowed, 12 were single, and in 2 cases no note was made. The fact that only 8.6% of these 144 cases were single men might be taken at once as an indication that prostatic hypertrophy is one of the uncomfortable consequences of matrimony, but without figures at hand to show what percentage of men over 50 years of age remain in single blessedness, it is impossible for me to judge in this matter. There have been many to assert that prostatic hypertrophy is largely due to sexual excesses, and were it possible for me to obtain a truthful history as to the sexual habits of my patients it might be possible to prove that such allegations are true.

As bearing upon this subject it may be interesting to note that there is not a single case in my series in which the patient was a Catholic priest, whereas there are 10 cases in which the patients have been Protestant ministers and all of them married.

That a history of frequent sexual indulgence is not a necessary precedent I know from a few cases in which the patient distinctly declared that he had not had coitus for many years before the beginning of his prostatic trouble.

Gonorrhœa.—Only 46 patients admitted having had gonorrhœa some time in their lives, and in only rare instances was the infection apparently of severe character. In only eight of the 144 cases was there stricture present, and in only three of these was it severe. In four cases the prostatic trouble seems to have been a direct continuation of an old gonorrhœa, but in the remainder of the cases in which gonorrhœa had been present there is nothing to show that it had anything to do with the onset of prostatic hypertrophy. In fact, many of these cases in which gonorrhœa at some previous time was acknowledged, show no evidence of chronic inflammatory changes in

the prostate, and it therefore seems evident that gonorrhœa cannot be considered as an etiological factor in the development of true hypertrophy of the prostate. That it may be the cause of a chronic prostatitis accompanied by marked obstruction to urination is undoubtedly true, but that it is not the sole cause or in fact the most frequent cause of chronic obstructive prostatitis is demonstrated by this series of cases, particularly those younger than 55 years of age, as described above.

We may add in passing that it seems clearly proven that Ciechanowski's assertion that nearly all cases of prostatic hypertrophy are inflammatory in origin is absolutely incorrect. That a certain amount of inflammation is undoubtedly present in many of the cases is perfectly true, but it is easy to explain the presence of prostatitis when the bladder is almost invariably infected and the prostatic urethra is frequently irritated and inflamed by the passage of catheters and infected urine.

Onset and initial symptoms.—The duration of time which had elapsed since the onset of trouble was as follows:

One year or less	6
Between 1 and 2 years	19
3 "	13
4 "	8
5 "	13
6 "	15
7 "	8
8 "	7
9 "	3
10 "	16
Between 11 and 15 "	24
Between 16 and 20 "	6
Between 21 and 25 "	2
Between 26 and 30 "	2
Not noted	3

In reviewing these cases one is struck with the great variations as regards duration and course of the disease presented. In 108 cases the time elapsed was 10 years or less (70%), and in 45 cases (30%) less than five years had elapsed since the beginning of the trouble.

In six cases the patient had noticed nothing unusual until the preceding year. In one of these cases (19) there was no urinary disturbance, the only complaint being intermittent attacks of severe

hematuria. On examination 220 cc. residual urine were found and a considerable enlargement of median and lateral lobes. In another case (138) the first symptom was nocturnal incontinence six months previously and up to time of admission there was no frequency or difficulty of urination, yet the catheter found 890 cc. residual urine and a very large prostate was removed. Three cases (14, 27, 115) had occasional complete retention of urine although there had been no symptoms up to a year previously. The sixth case (94) had a small cystin calculus and a pedunculated median lobe and contracted bladder, but had never used the catheter.

In 10 cases the onset of the disease had been from 16 to 30 years before. One of these cases (50), age 71, had begun to have difficulty of urination 30 years before, but the disease had remained stationary until five years before, when he was catheterized for complete retention of urine. On entrance he was voiding urine every hour with considerable difficulty and slight pain, but did not require a catheter. The prostate was small and soft and there was only a slight median bar, but 1100 cc. residual urine was present.

Another case (137), also of 30 years' duration, was only 37 years of age, and at the age of seven noticed difficulty and frequency of urination which persisted up to time of admission. The prostate was not enlarged and there was only a small median bar present, but the residual urine varied from 400 to 600 cc. and the catheter was necessary once or twice daily.

One case (89) which had persisted for 27 years had directly followed stricture of the urethra due to gonorrhœa. The catheter had been necessary at times. There was 100 cc. residual urine, a contracted bladder with a large ulcer, a prostate which was only slightly enlarged, with a small median bar inflammatory in character.

In another case (16) symptoms of frequency and difficulty and occasional complete retention had been present for 25 years, and suprapubic drainage had been necessary one year previously. The prostate was very great in size, the tissue removed weighing G-240.

In three cases (70, 84, 101) the onset was 20 years before, and during this time there had been pain, difficulty, and frequency of urination.

In two of these (70, 101) calculi were present. One had used a catheter for nine years, and one year previously suprapubic drain-

age had been provided. The prostate in this case was large and adenomatous in type. In the other two cases (84, 101) it was small and inflammatory in type.

One patient (120) complained only of painful erections which had been present for 19 years, and to relieve which he found it necessary to void urine several times during the night, but when erections did not occur he would sleep all night without urinating. Urination was somewhat difficult particularly at the beginning but there was no increased frequency of urination. The prostate was distinctly enlarged and the cystoscope showed a considerable intravesical hypertrophy of the right lateral lobe, which was removed at operation.

One case (4) had begun to have frequency and difficulty of urination 17 years before and during the last five years frequently required catheterization. The prostate was only moderately hypertrophied.

The last case (63) in which the symptoms had been present for 16 years had had complete retention of urine 14 years before, and had been subjected to several suprapubic operations for calculus and severe hemorrhage from the median portion of the prostate, and a suprapubic drainage apparatus had been worn for seven years. A very large prostate was removed.

The onset symptoms were as follows:

Frequency of urination	88	Cases.
Difficulty of urination	78	"
Pain	25	"
Hematuria	7	"
Complete retention of urine	8	"
Incontinence of urine	8	"
Painful erections	1	"

Frequency and difficulty of urination, as shown above, are by far the most frequent initial symptoms of prostatic hypertrophy occurring in 60% and 55% of the cases respectively. At the beginning both of these symptoms are as a rule very slight in character, and the onset is generally so gradual that it is difficult for the patient to state exactly when urination began to be abnormal. The increase in frequency has generally been recognized first, because the patient had to arise once or twice to urinate, and in many instances this was the only symptom for a considerable period of time. Difficulty of urination has generally been discovered, first because the patient was unable

to start the flow of urine as quickly as usual when the desire came on. In other cases the patient has noticed that the stream was definitely smaller than normal and that force was required to void, so that definite obstruction was recognized, but in a great many cases no obstruction has been appreciated for some time after the beginning of the disease.

In a number of cases the frequency and difficulty of urination have been intermittent in character, and after the initial attack normal urination has followed for a time.

Pain.—Pain has been noted as an onset symptom in 25 cases. In 12 cases there was only a slight burning in the urethra during urination and in 3 the pain was merely the discomfort produced by severe straining to void. In one case there was a sharp pain which followed sudden stoppage of urine during micturition. One case (5) was characterized by a severe pain which came on at the beginning of urination being apparently located in the base of the bladder, but rapidly radiating from there upward "along the course of the ureter and terminating in the region of the right kidney" where it would last with considerable intensity for three minutes. These symptoms which came on suddenly persisted for one month, during which time they recurred with each urination, they were finally relieved by going to a mineral spring and drinking water in abundance. No calculus was ever passed or found in the bladder.

Eight of the 24 cases complaining of pain had calculus of the bladder. In two cases (37, 122) the first pain was a severe attack of pain in the back (probably renal colic), followed by vesical pain, due to the passage of stone into the bladder. In six of the cases there was no pain in the back and the stone was probably vesical in origin. In three calculus cases the pain at onset was a slight smarting during urination located in the urethra. Two of the calculus cases began with sudden severe pain in the urethra, but in another case there was only a very slight irritation at the neck of the bladder.

The last case (47), in which a very large oxalate calculus was afterwards removed, the onset symptom was a burning sensation in the urethra during the night, and a slight frequency of urination during the day, 10 years before admission. Six years later he began for the first time to get up at night to urinate and after that urination was very frequent during the day but there was no pain until one month before admission, and then only a slight dull feeling of soreness in

the urethra during and after urination. There was never any severe pain or hematuria, and yet at operation a mulberry calculus with very large rough spicules and about 6 cm. in diameter was removed. The fact that there was only 15 cc. residual urine and a bladder which was greatly contracted (capacity 50 cc.) makes the absence of pain all the more remarkable.

One case (52) began with pain in the kidney three years before admission. He died after operation and autopsy showed double pyonephrosis.

A most peculiar case (120) was one of considerable prostatic hypertrophy in which the onset symptom, and in fact the only symptom during the 19 years preceding his admission to the hospital was a severe pain in the perineum and deep urethra coming on at night and always associated with erection of the penis. Although the prostate was quite large there was never any difficulty or frequency of urination, but the patient would have to arise to urinate several times almost every night on account of painful erections, and it was on this account that he sought relief.

Hematuria.—This was present as an onset symptom, as stated above, in seven cases. Only one of these patients suffered with calculus (case 23).

In one case (19) without previous urinary trouble the patient voided several large clots and during the following year there were five attacks of painless hematuria during which much blood was lost. On admission there was no frequency or difficulty of urination, but a considerable enlargement of both lateral and median lobes was present.

In another case (46) there were two hemorrhages from the bladder which appeared some time before any other urinary disturbance, but did not reappear.

In two cases (20, 27) there was hemorrhage at the end of urination, which reappeared at intervals for several years up to the time of operation.

In one case (16) the disease began with hematuria 24 years previous to admission. After treatment at a mineral spring the blood did not appear again.

The last case (84) began with profuse hematuria and a diagnosis of congestion of the kidneys was made, but after a short while the hemorrhage disappeared and did not reappear during the 20 years of his trouble.

It seems remarkable that hematuria is so infrequent in cases of prostatic hypertrophy which were associated from the beginning with vesical calculus, and the fact that in the seven cases detailed above only one was associated with calculus shows that the latter has very little to do with initial hematuria. Of particular interest are the cases of profuse hematuria recurring at intervals (and shown later to come from considerable median prostatic enlargement), but entirely free from urinary disturbance of a serious character.

Complete retention of urine.—This has been the first symptom in eight cases. One case (81) had complete retention of urine 12 years before admission and was catheterized for two days, but never required catheterization afterwards. The second case (31) had complete retention of urine five years before, due to impaction of a small calculus in the urethra which was passed in three days. The third case (14) began with complete retention of urine and required catheterization at intervals afterwards. The fourth case (62) began with complete retention of urine three years before, and had to be catheterized for three months, but was never catheterized after that. Th fifth case (128) began with complete retention of urine 12 years before and required catheterization occasionally afterward. The sixth case (22) began with complete retention 10 years before, but voided without catheterization. For two years before admission the catheter was used daily on account of incomplete retention. The seventh case (139) began with complete retention 10 years before but was relieved by medicines internally and began the use of the catheter again only five weeks before admission (on account of incomplete retention). The eighth case (8) began with complete retention of urine during typhoid fever and was catheterized for several weeks. Afterwards the patient was catheterized occasionally owing to complete retention or difficult urination.

It will be noted that in none of these cases did retention of urine ever become permanently complete, and in fact it is remarkable that the subsequent course was characterized by less use of the catheter than is usually present in most cases of prostatic hypertrophy. It is also interesting to note that in four of these cases the complete retention of urine came on 10 years or more before admission to the hospital, and yet none of these cases became dependent upon the catheter.

Incontinence of urine.—As mentioned above this occurred in eight cases as an onset symptom, but in two of these there was merely a

slight dribbling of urine at the end of micturition. In three cases, however (28, 136, 138), the only symptom was nocturnal incontinence of urine which occurred every night, and was not associated with any frequency or difficulty of urination. In one case this was present for three years, when complete retention of urine came on and catheter life was begun. In the second case (136) it persisted as the only symptom during the two years previous to admission, and in the third case (138) it had been the only symptom present for six months previous to admission.

All of these cases were similar in having no frequency or difficulty of urination and no incontinence by day. Two were catheterized for the first time in the hospital and 580 and 600 cc. residual urine respectively was withdrawn.

The sixth case (3) was associated with tabes dorsalis and came on with frequency and difficulty of urination, and nocturnal incontinence of urine 14 years before admission. These symptoms persisted for three months, when he was catheterized by a physician and after that was unable to void and led a catheter life for 14 years. (It is interesting to note that natural urination at normal intervals was established in this case by removal of the prostate, which was moderately but definitely hypertrophied.)

The seventh case (119) began two years before admission with occasional incontinence of urine during the day and a feeling of pressure in the bladder, but with no difficulty or frequency of urination. There was also marked impairment of sexual powers and of the knee-jerks. He was catheterized and led a catheter life afterwards. After prostatectomy the incontinence persisted and girdle pains and other symptoms of spinal disease showed themselves.

The eighth case (100) began with incontinence, difficult and painful urination eight years before admission. The incontinence persisted for only a few weeks.

Remarks.—A study of these eight cases with incontinence as an onset symptom shows that with exception of two cases the disease was due to over-distention of the bladder and not to spinal disease, and the fact that they have been cured by prostatectomy shows that this symptom is no contraindication to operation. The incontinence is probably due to the peculiar disposition of the prostatic enlargement at the vesical orifice leaving an opening through which the urine can continuously escape, but why the external sphincter does not prevent

the incontinence is to me inexplicable, in view of the fact that after suprapubic prostatectomy the prostatic orifice is often very greatly dilated, and yet incontinence very seldom occurs.

B. STATUS PRÆSENS.

The symptoms present on admission were as follows:

a. Pain, slight	16	Cases.
considerable	61	"
b. Hematuria, slight	7	"
considerable	15	"
c. Difficulty of urination, slight	10	"
considerable	78	"
d. Incontinence of urine	6	"
e. No increase in frequency or difficulty of urination	3	"
f. Frequency of urination, 95 cases in which the interval between urinations was less than ½ hour in	7	"
Between ½ and 1 hour in	25	"
1 hour in	37	"
2 hours in	19	"
3 hours in	7	"

a. Pain.—As shown above, pain has been present in over 50% of the cases. In some of the cases it was very slight, and evinced itself as a burning or aching pain in the deep urethra and generally worse during urination. In the majority of cases, however, it was fairly considerable and was characterized by pain which began in the neck of the bladder just before urination and radiated from there to the end of the penis. In some instances this pain was very severe and was accompanied by marked vesical tenesmus, straining and abdominal spasm, this was particularly true in 20 cases associated with calculus in the bladder, but there were many other cases in which the pain was just as severe in which no calculus was present. In a number of these cases a severe pain radiating to the end of the penis and felt most severely just behind the glans, and which is considered almost pathognomonic of vesical calculus was present. This severe pain without the presence of calculus was frequently due to cystitis and was often associated with vesical contracture. In other cases, however, it was associated with considerable distention of the bladder and a large residual urine. In some instances the pain came on when the bladder became full and completely disappeared after catheterization, but in several cases the catheter afforded no relief. One of these patients

(54) catheterized himself 12 times a day. The bladder was contracted and considerably inflamed, but there was no stone found and natural urination has been established by prostatectomy. Another such case (10) voided urine every two hours with great pain and difficulty. There was only 100 cc. residual urine and the bladder was markedly contracted, but no calculus was present. Another case (117) voided urine every half hour with great pain, but there were only 80 cc. residual urine present, and no calculus. Several cases in which the prostate was not enlarged except in the shape of a small median bar and in whom the microscope showed chronic prostatitis, belonged to these cases of frequent and painful urination with contracture of the bladder and little residual urine.

Two cases in which calculi were found were remarkable for the absence of pain. One (23) had a calculus about 2 cm. in diameter, but the bladder was very greatly distended, holding 2000 cc. residual urine. In the other (47) the bladder was greatly contracted and there was very little residual urine and the stone was very large, and it is difficult to explain the absence of pain. In several cases the patient complained of a dull aching pain in the back, and in four cases there was definite evidence of renal infection and a suggestion of renal calculus. A slight dull aching pain in the rectum was not an uncommon symptom and appeared most frequently during and after defecation, but in only a few cases (notably cases 114, 28) was there a severe aching pain present in the rectum. In both of these large vesical calculi were present.

In one case (5), mentioned before when discussing onset symptoms, the pain began in the bladder and radiated to the kidney. One case (130) was remarkable on account of very severe pain, which was located in the lumbar region of the spine and was accompanied by paroxysms of excruciating pain which occurred at frequent intervals and were provoked by movements of any sort. A spinal tumor was suspected but no other symptoms suggesting it were present.

Remark.—In reviewing the occurrence of pain in these 145 cases of benign prostatic hypertrophy one is struck by the fact that it is limited almost entirely to the region of the bladder and urethra, and in almost all cases is intermittent in character, coming on generally as the bladder becomes full, generally increasing during urination and sometimes being very severe at the end. A pain radiating to the

end of the penis, which is considered so suggestive of stone, is often seen, without the presence of calculus, and simply means that spasmodic pain originating in the prostate is generally referred down the urethra and most often to the end of the penis.

It is interesting to note that the pains presented in these cases are entirely different from those generally seen in cases of carcinoma of the prostate, in which pain is a very much more prominent symptom, is often almost constantly present as a dull or severe aching in the prostate, rectum and perineum, and in the more advanced cases is associated with severe pain in the back, buttocks, thighs, and legs following the course of the pelvic nerves.

b. Hematuria.—As stated above this was present in 22 cases (15%), but in seven cases was slight. It is interesting to note, that in the 24 cases which were associated with vesical calculus, hematuria was present in only seven cases. Among the 17 cases in which it was absent were three cases in which very large calculi were found, and in the other cases, from one to seven calculi were present, and of varying size and character. In many of these cases the bladder was contracted so that one would have expected hematuria as a result of the calculi being forced against the prostatic orifice at the end of urination, but such was not the case. In the five cases in which hemorrhage was a conspicuous feature of the disease, calculi were not present (cases 19, 74, 27, 63, 11).

It is interesting to note also that in none of these cases was a catheter used, the hemorrhage coming on spontaneously and without apparent reason. In two cases (19, 11) in which the hemorrhage was very marked, urination was almost normal and there was little or no residual urine, and in another case (63) in which very alarming hemorrhages occurred, constant suprapubic drainage was present and there was no traumatism and no vesical spasm to account for the hemorrhage. These three cases, however, were each associated with considerable intravesical prostatic hypertrophy.

c. Difficulty of urination.—The 10 cases in which the difficulty of urination was described as slight comprise very interesting cases. In three cases there was over 1000 cc. residual urine (44, 30, 107) and neither of these patients had been catheterized. One was associated with a very large diverticulum of the anterior wall of the bladder. One (94) had calculus. One (19) had had severe attacks of hema-

turia. One (5) suffered severe pain in bladder and kidney, and two cases in which small median lobes were present occasionally had complete retention of urine. One (143) voided with ease at fairly normal intervals and there were only 65 cc. residual present, but the cystoscope showed a fairly large diverticulum (which had dragged the left ureter into this orifice) and other evidences of considerable intravesical obstruction.

In 78 cases there was considerable or very great difficulty of urination, and many of these cases used a catheter more or less frequently to obtain comfort. In a number of instances efforts at urination were attended with very great difficulty, severe spasm of the abdomen and bladder, and not infrequently compulsory defecation so that it was necessary for the patient to go to stool every time the desire to urinate came on (and this very frequently).

In many cases although the prostate was considerably enlarged, and a large amount of residual urine was present, micturition was not very difficult or frequent, and had it not been for the discomfort of a distended abdomen, slight pain and occasionally hematuria, the patient would probably not have sought operative relief. A number of the cases presented great variability as to the difficulty of urination, at times going several weeks with almost normal urination, when suddenly an attack of difficulty, frequency and pain on urination would come on without apparent cause, and not infrequently requiring catheterization.

d. The six cases of dribbling of urine have been spoken of before (see onset symptoms). With one exception they were all characterized by a greatly distended bladder which had never been catheterized. In one case (84) the bladder was contracted, irritable, there was only 250 cc. residual urine, and the prostate was of the small inflammatory type.

e. The three cases in which there was no difficulty of urination were each characterized by considerable enlargement of the prostate, and in two cases, both of which had never been catheterized (cases 118, 138) there was 660 cc. and 890 cc. residual urine respectively present, and both suffered from nocturnal incontinence of urine. The third case (120) showed 35 cc. residual urine, but the bladder was trabeculated and contracted. The only complaint was pain in the perineum, associated with frequent erections at night.

Sexual Powers.

The following tabulation gives the condition as regards presence of erections and indulgence in sexual intercourse on admission. The cases have been grouped according to age as follws:

Erections.	Under 50 yrs.	50 to 59	60 to 69	70 to 79	80 to 90
Present	5 Cases.	21 Cases.	30 Cases.	9 Cases.	0 Cases.
Impaired	0 "	3 "	13 "	4 "	0 "
Not present	0 "	3 "	14 "	15 "	2 "
Not noted	0 "	5 "	9 "	12 "	3 "
Sexual Intercourse.					
Normal	4 Cases.	17 Cases.	17 Cases.	4 Cases.	0 Cases.
Impaired	0 "	5 "	11 "	0 "	0 "
Not performed	0 "	1 "	14 "	15 "	0 "
Painful	0 "	1 "	3 "	0 "	0 "
Not noted	1 "	5 "	11 "	14 "	4 "

According to the above figures the sexual powers in patients under 50 years of age were normal in 100% of the cases.

Between 50 and 60 years of age, erections were normal in 78% of the cases noted, and present but impaired in 11%, and coitus was normal in 74% of the cases noted, and present but impaired in 21%.

Between the ages of 60 and 69, erections were normal in 55% of the cases, and impaired in 25%. Coitus was normal in 38%, and present but impaired in 32%.

Between the ages of 70 and 79, erections were present in 32% of those noted, and impaired in 14%. Coitus was normal in 21%.

Catheter Life.

a. Complete retention of urine occurred at some time in 64 cases, and required the use of the catheter. The time at which this occurred was as follows:

Less than 1 month before admission	13 Cases.
Between 1 and 6 months "	6 "
1 year "	7 "
2 years "	13 "
3 years "	7 "
4 years "	1 "
5 years "	5 "
6 to 10 years "	11 "
14 years "	1 "
Time not noted	1 "
Total cases with complete retention at some time	65 "

b. No attack of complete retention, 45 cases.

c. No catheterization for any cause, 20 cases.

d. The catheter had been employed more or less regularly for incomplete retention of urine in 70 cases, as follows:

Less than 1 month	9	Cases.
Between 1 and 6 months	20	"
1 year	9	"
2 years	8	"
3 "	4	"
5 "	3	"
7 "	1	"
8 "	2	"
9 "	2	"
12 "	1	"
14 "	1	"
16 "	1	"
Time not noted	9	"

e. The patient led a catheter life, retention of urine being complete in 35 cases, as follows:

Less than 1 month	12	Cases.
Between 1 and 6 months	2	"
1 year	5	"
2 years	6	"
3 "	2	"
4 "	1	"
6 "	1	"
7 "	1	"
8 "	2	"
9 "	1	"
14 "	1	"
Not noted	1	"

f. In these 35 cases in which retention of urine was complete (*e*) the catheter was employed by the patient when admitted to hospital at the following intervals daily.

2 hours	1	Cases.
3 "	2	"
4 "	3	"
5 times daily	5	"
4 " "	9	"
3 " "	6	"
2 " "	3	"
Occasionally complete	5	"
Not noted	1	"

g. In 55 cases the retention of urine was incomplete, but the catheter was employed at the following intervals daily:

2 hours	1	Cases.
4 "	2	"
5 times daily	2	"
4 " "	3	"
3 " "	6	"
2 " "	20	"
1 " "	8	"
Occasionally	11	"
Not noted	2	"

h. The catheter had never been used in 31 cases.

i. In cases it was not being used on admission to hospital although it had been necessary at some previous time owing to one or more attacks of retention of urine.

j. In seven cases suprapubic fistulæ were present, and no urine came through the urethra.

k. In three cases the urine passed through a retained catheter in the urethra.

l. In two cases catheterization was impossible and suprapubic aspiration was employed.

m. The amount of residual urine found with a catheter was as follows:

Less than 50 cc.	11	Cases.
Between 50 and 100 cc.	16	"
100 cc.	13	"
150 cc.	7	"
200 cc.	10	"
250 cc.	11	"
300 cc.	9	"
350 cc.	3	"
400 cc.	6	"
500 cc.	9	"
600 cc.	3	"
660 cc.	1	"
890 cc.	1	"
940 cc.	2	"
1000 cc.	1	"
1100 cc.	1	"
1150 cc.	1	"
1200 cc.	1	"
2000 cc.	1	"

n. The bladder capacity on examination was found to be as follows:

50 cc.	4	Cases.
100 cc.	3	"
150 cc.	14	"
200 cc.	11	"
250 cc.	16	"
300 cc.	22	"
400 cc.	54	"
500 cc.	5	"
600 cc.	3	"
700 cc.	1	"
800 cc.	1	"
900 cc.	1	"
1000 cc.	2	"
1100 cc.	1	"
1200 cc.	1	"
2000 cc.	1	"

o. In 25 cases with calculus present the residual urine and bladder capacity was as follows:

	Retention incomplete. R. U.		Retention incomplete. B. C.		Retention complete. B. C.	
Less than 50 cc.	5	Cases.				
50 cc.	2	"	2	Cases.		
100 cc.	4	"	3	"	1	Case.
150 cc.	3	"	3	"	1	"
200 cc.	4	"	3	"		
250 cc.			4	"		
400 cc.	2	"	2	"	1	"
500 cc.			2	"		
2000 cc.	1	"	1	"		
Suprapublic fistula 325 cc.					1	"

The Condition of Patient at Time of Operation.

As bearing somewhat upon the condition of the patient it will be interesting to refer to the table of ages, which shows that 45 cases were over 70 years of age (31%) and that 16 cases were between 75 and 79 years of age, four between 80 and 84 years of age, and one 87 years of age. Eighteen cases were described as being in a very weak condition, and one of these had developed the morphia habit. In seven cases there was marked emphysema of the lungs. Arteriosclerosis was a very common finding, but in six cases it was very marked, and in one case was associated with severe attacks of

angina pectoris (67), and in another case with hemiphlegia (91). In 22 cases heart murmurs and other evidence of old endocarditis were present, and in eight cases the heart was enlarged although no murmurs were heard. In many cases the heart was well compensated, but in several instances there was considerable lack of compensation, and the condition of the heart was serious. Two of the fatal cases were classed among these.

There was definite kidney infection in six cases (69, 109, 24, 75, 70, 52) and in two cases nephrolithiasis.

Five patients were suffering from uremia, in two cases of a very severe type and associated with considerable fever (109, 52).

Urinayses.—The urine was of low specific gravity and of low area content in so many cases that it is impossible to say just how many were suffering from definite nephritis.

That a great many cases were complicated with more or less severe kidney lesions is undoubtedly true. The correct estimation of albumin and the finding of casts was interfered with in most cases by the large amount of pus present, but in 10 cases granular casts were found, and they were probably present but not detected in many others.

In one case (20) there was complete suppression of urine before the operation, and in three other cases nausea and vomiting with other symptoms of uremia.

The urine was acid in 111 cases and alkaline in 14, and neutral in five cases. It was clear and contained no pus in eight cases. Pus was present and noted in 126 cases, and in 13 cases the presence of casts was noted.

In most cases the urine was examined immediately after voiding in a clean vessel, a stained specimen being made after centrifugalizing. In 53 cases bacilli of the colon type were present. In 14 cases cocci, probably staphylococci, were present. In 18 cases the urine was sterile, no bacteria being found after careful examination. In 13 cases bacteria were found, but the character was not noted.

Epididymitis.—Epididymitis had been present at some time before operation in 29 cases (20%). In 19 cases it was single and in 10 cases both sides were involved. In three cases acute epididymitis was present at the time of operation.

Hernia.—Hernia were present in 16 cases, single in 11 and double

in 5, all in the inguinal region. One case also had a ventral hernia following suprapubic prostatectomy.

Hemorrhoids were frequently present and generally gave no trouble after the prostatic obstruction had been removed.

Stricture of Urethra.—Definite stricture of the urethra was present in eight cases. In two cases (82 and 89) dense hard strictures of small caliber were present in the bulbo membranous region. Three cases (141, 133, 73) had strictures of the bulbous urethra of large caliber, but in the last case quite fibrous in type. In three cases (95, 55, 53) strictures of the pendulous urethra were present, and in two cases were quite fibrous and required dilatation. It is probable that strictures of large caliber were present in other cases, but as a careful examination of the anterior urethra with bougies-à-boule was not made a routine procedure, some cases may have been overlooked. A careful examination for strictures should always be made as their presence has much to do with the closure of perineal fistula after prostatectomy, which fact a study of the above cases forcibly brought out.

Previous operations.—A Bottini operation had been performed in six cases, four by myself. These cases are of interest. Case I (108) had considerable enlargement of both median and lateral lobes. Two attempts were made to perform the Bottini operation, but both were unsuccessful owing to the burning out of the electrical transformer which was used in this particular hospital (not the Johns Hopkins). This is the only case in which this accident happened in my practice.

Case II (11), characterized by two very large lateral lobes, was completely relieved of all urinary obstruction and urinary frequency by the operation, but began to have severe hemorrhages one year later and perineal prostatectomy was performed to remove the very large intravesical lobes and the bleeding ceased.

Case III (24) had a small median lobe, a contracted bladder and little residual urine, and was not improved by the Bottini operation.

Case IV (145) was exactly similar to case III.

Case V (71) had been subjected to two Bottini operations and one perineal prostatectomy in Germany without success. An examination showed a small globular median lobe.

Case VI (9) had had three Bottini operations and suprapubic drainage.

Suprapubic prostatectomy had been previously performed in two cases (by others) with unsuccessful results. In both of these cases (83, 116) considerable enlargement of the prostate remained.

Perineal prostatectomy had been performed in one case mentioned above.

Castration had been performed in three cases (24, 25, 145), in all with unsatisfactory results. In two cases perineal prostatectomy showed the lateral lobes very little enlarged and possibly atrophic, but an obstructing median bar was present. In the third case the prostate was very large and showed not the slightest evidence of atrophy.

Suprapubic drainage had been supplied in eight cases, and the patients wore some form of drainage apparatus on admission to the hospital, and were unable to void through the urethra.

Suprapubic lithotomy had been employed in one case and was followed by closure of the bladder. In three of the cases in which the sinus persisted calculi had been present.

Litholapaxy had been performed several years previously in one case.

Perineal section on account of stricture of the urethra had been performed in two cases (89, 82). In both of these cases very severe urethral strictures were present and the prostatic obstruction was inflammatory in type.

The Character of Prostatic Enlargement.

Rectal examination.—The size of the prostate as determined by rectal examination was as follows: Apparently not enlarged, 4 cases; slightly but definitely enlarged, 36 cases; moderately enlarged, 50 cases; considerably enlarged, 52 cases; very greatly enlarged, two cases; huge, one case.

The exact description of the size of a prostate as felt by rectal examination is always difficult, and I have as yet found no satisfactory method of stating the size that I think a prostate is, on rectal examination. In almost all of these 145 cases the record of examination is my own, so that variations which may arise when examinations are made by numerous observers is largely eliminated.

The facility with which a prostate may be felt in a given case has much to do with the impression one gets of its size, *e. g.*, in a very thin person with a slight amount of perineal tissue the prostate usually

seems larger than in cases in which the perineum is fatty and the prostate difficult to reach.

The four cases in which the prostate was apparently not enlarged were shown with the cystoscope to have definite enlargement of the median portion (bar or lobe), and in many of the cases, in which the enlargement was described as slight, the obstruction was largely of this type, but although these cases showed only a slight hypertrophy of the prostate they were accompanied by symptoms sufficiently severe to require relief, and in many instances the obstruction was as complete as with some of the largest prostates. In this series of cases it was shown conclusively that cystoscopic examination was absolutely necessary to determine the cause of the obstruction, for in many of these small prostates one would not have been justified without cystoscopic examination in saying that the prostate was responsible for the symptoms and obstruction present.

In many of the larger prostates the rectum was considerably impinged upon by the prostatic mass and in some cases very little space was left between the posterior surface of the prostate and the sacrum. Many of these cases suffered with considerable bowel obstruction, chronic constipation, and in some cases defecation was not only difficult but painful. It is remarkable, however, that pain in the rectum was notable particularly for its absence, thus differentiating these cases from the malignant prostates.

Surface.—The posterior surface of the prostate was described as irregular in 14 cases and nodular in one. This irregularity usually consisted in the presence of one or two prominent lobules which projected from the general level of the prostate. In four or five instances it seemed as if a small lobule of gland tissue had broken through the capsule and developed extraprostatically (so to speak). This was most commonly present at the upper end of one of the lateral lobes, by the side of the ejaculatory duct, where the capsule is known to be least dense.

In other cases, however, the surface of the prostate was distinctly irregular. This irregularity was most common at the upper end of one or both of the lateral lobes, and was usually associated with a certain amount of chronic prostatitis and seminal vesiculitis. Occasionally, however, the lateral borders of the prostate presented an irregular ridge. Periprostatic adhesions and bands were present in a few cases, in some instances producing septa which stood out prominently in the rectum.

In the vast majority of cases, however (130 out of 145), the surface of the prostate was smooth and the general contour fairly regular and symmetrical with the exception of an occasional greater enlargement of one of the lateral lobes. The median furrow and notch were obliterated in many cases, but in others they were wide and deep. I could make out very little relationship between the character and amount of obstruction present and the presence or absence of furrow or notch. It is generally held that when the median lobe is enlarged the superior notch is obliterated, and while this is true in many cases, and particularly those of large median lobes, I have seen a number of cases with little or no median enlargement in which the notch and furrow were obliterated, and cases of median enlargement in which the notch was present.

My opinion is that the notch and furrow are dependent upon the direction of growth of the lateral lobes and whether they are closely bound together by the capsule or not. Where the capsule is lax and thin the lateral lobes frequently have a divergent growth, a tendency to grow laterally, and upward and outward into the region of the seminal vesicles, and in such cases we frequently find wide and deep furrows and notches. I have noticed that such cases are frequently associated with very little obstruction to urination in comparison with the size of the prostate, and I believe it is because, not being firmly held together by the capsule, they do not greatly compress the urethra, and urination is little interfered with.

Consistence of prostate.—The prostate was described as distinctly soft in 56 cases; elastic in 26 cases; firm in 45 cases; moderately hard in 14 cases; very hard, no cases.

The seminal vesicles were slightly indurated in 19 cases, and moderately indurated in five cases, in the remaining cases there was no induration found.

The intervesicular space was slightly indurated in two cases and moderately indurated in two cases. The whole base of the bladder felt hard in one case.

Glands were palpable in the pelvis in five cases.

As shown by the above figures the soft and the elastic prostates form by far the greater number, in fact these two varieties should be classed together, as there is only a slight variation between them. The prostate in such cases was soft, compressible, generally elastic but at times

boggy. The capsule covering it was apparently very thin and the consistence was usually uniform, though small areas or lobules of a firmer consistence were sometimes present.

The size of the prostate in these cases was generally considerable, there being only eight out of the 40 cases which were described as slightly enlarged in which the prostate was soft.

The 45 cases in which the prostate was described as firm comprise cases in which there was no induration present and in which the prostate was elastic, but the elasticity was of moderate degree and evident only on moderate pressure. The consistence in these cases was usually uniform and the surface smooth.

In the 14 cases classed as moderately hard the consistence was not elastic, but quite firm, although not of stony hardness. In these cases there was usually no uniformity in consistence, there being places of greater induration than others and often slight irregularity of surface, and the induration was generally most marked at the upper end along the region of the ejaculatory ducts and adjacent to the bases of the seminal vesicles.

The complete absence of cases of stony hardness of the prostate is interesting as showing an important differentiation between benign and carcinomatous enlargement. The figures in regard to the seminal vesicles are not entirely accurate owing to the fact that they could not, owing to the size of the prostate, be reached with the finger in many cases, but among the 90 cases of slight and moderate enlargement of the prostate it should have been possible in nearly all cases to appreciate induration in the region of the seminal vesicles and in the intervesicular space had it been present. I therefore feel safe in asserting that in the great majority of cases of enlarged prostate, the seminal vesicles are negative.

A study of the cases in which the prostate was described as moderately hard shows that the prostate was only slightly enlarged in most of the cases, and microscopic examination showed a condition of chronic prostatitis or fibro-muscular hypertrophy. In five cases in which a single hard area, usually a small rounded lobule which projected beyond the limit of the prostatic capsule at the upper end of the prostate on one side, was present, the prostate was more or less considerably enlarged, but the rest of the prostate in each of these cases was described as smooth and elastic. No case of considerable enlargement of the prostate with marked general induration is present in this

series, and this is all the more remarkable because there are many cases of considerable prostatic hypertrophy in which the microscope shows marked prostatitis. There is, however, usually a large amount of adenomatous tissue present, and the softness which this imparts has apparently been sufficient to keep the prostate from feeling hard.

In two cases small smooth isolated lobules with marked induration projected from the anterior portion of a prostatic lobe, and the sections in both of these cases showed localized prostatitis in these portions.

Two cases in which the prostate was considerably indurated and irregular were found at operation to contain numerus seed calculi, which was scattered throughout the prostate, but were particularly numerous just beneath the posterior capsule. In both of these cases the induration was sufficient to make us suspect carcinoma.

A review of the 24 cases which showed more or less induration of the seminal vesicles or intravesicular space reveals but three cases of more than slight enlargement of the prostate. In the majority of instances the prostate was of a small fibro-muscular or chronic inflammatory type, and the process in the vesicles was evidently similar in character. In most cases it was shown merely as a slight thickening of the seminal vesicles. In four cases an indurated cord or two was present in the region of the vesicle, and in five cases one or more enlarged glands could be felt adjacent to the seminal vesicle or along the pelvic wall a little further out.

The great rarity of palpable or enlarged glands in the pelvis in these cases is all the more remarkable when we consider the large number of cases in which there is considerable vesical infection and inflammation which has extended to the prostate and seminal vesicles. This observation is true also as regards cases of chronic gonorrhœal prostatitis and seminal vesiculitis, in which I have made many careful examinations and have only found palpable glands in very rare instances. The fact, too, that in fatal cases of carcinoma of the prostate, enlarged glands have been found at autopsy in the pelvis in only 27 out of 100 cases would seem to show, along with the findings given above, that the pelvic glands are little prone to involvement either in inflammatory or in malignant disease of the prostate, and therefore their presence or absence is apparently of very little diagnostic value in differentiating benign and malignant prostatic enlargement.

The indurated cords which have been mentioned above were similar to those which are commonly felt in chronic inflammation of the

prostate and seminal vesicles, and are in some cases, I believe, simply indurated vasa deferentia. In other cases, especially where multiple, they are certainly indurated lymphatics which accompany the seminal vesicle.

In view of the importance of induration in the region of the prostate and seminal vesicles, I will give briefly the rectal findings in four cases which were afterwards found to be carcinomatous.

Case I.—No. 10, carcinoma series. Frequency and difficulty of urination for three years; no pain until recently. He has complete retention of urine and 1500 cc. is withdrawn. The prostate is only slightly larger than normal, smooth, uniformly indurated and of stony hardness. Both seminal vesicles are slightly indurated. The cystoscope shows no intravesical lobe, but a small hypertrophied collar all around the orifice. With finger in rectum and cystoscope in urethra there is considerable increase in the median portion. At operation both lobes were extremely fibrous, closely attached to the capsule and had to be excised with scissors and scalpel. The tissue removed weighed only G-8, and microscopically showed carcinoma.

Case II.—No. 11, carcinoma series. Frequency and difficulty of urination for four years. Pain in bladder, no hematuria. The prostate is moderately enlarged, round and smooth. The right lobe is the larger and is slightly indurated, but is slightly hard, but the induration does not extend into the region of the seminal vesicles. Several indurated cords run upward from it to the lateral walls of the pelvis. The left lobe is smaller, softer and there are no indurated cords. The seminal vesicles are not palpable, there is no intervesicular mass and no enlarged glands. The cystoscope cannot be introduced into the bladder. At operation the prostate was not difficult to separate from the rectum and was only slightly indurated. At the upper end the right lateral lobe was adherent and had to be excised with scissors. Examination showed an area deep yellow in color and hard as cartilage. The rest of the hypertrophy was benign in appearance. Sections from the suspicious area showed adenocarcinoma.

Case III.—No. 9, carcinoma series. Frequency and difficulty of urination two years. Pain in the urethra, no hematuria. The prostate is considerably enlarged, smooth, rather hard in consistence, the median furrow is shallow, but the notch is quite deep. The seminal vesicles cannot be palpated, but the lateral lobes extend upward and outward into the region of the seminal vesicles and are quite closely adherent to the pelvic walls. The cystoscope shows two large intravesical lateral lobes; no median lobe present. At operation the lateral lobes were surprisingly small and very adherent. Microscopic examination showed benign hypertrophy with one small area of definite malignancy.

Case IV. No. 12, carcinoma series. Occasional frequency of urination for one year. Pain during urination for six months. The prostate is very slightly enlarged, irregular and very hard. At the base of the right seminal vesicle there is a small area of induration 1 cm. in size, above that the seminal vesicle is negative. The left vesicle is negative. The membranous urethra is enlarged, hard, the induration being continuous with that of the prostate and extending to the bulb. No enlarged glands felt. It is impossible to pass instruments owing to tight stricture in the membranous urethra. At operation the prostatic tissue was very hard, adherent to the capsule, and had to be cut away with scissors especially in the region of the base of the right vesicle. The microscope showed carcinoma.

Benign cases suggesting malignancy:

I (105). Cystitis and frequency of urination 15 years ago. No history of complete retention of urine. Micturition three or four times at night and twice in the day. No hematuria nor pain. The prostate is moderately enlarged, smooth, firm but not of stony hardness and slightly elastic. There is induration at junction of prostate and seminal vesicle on both sides, and several firm fibrous cords are felt extending from the middle and from the upper end of the prostate to the pelvic wall on both sides. The seminal vesicles are not markedly indurated and there is no intervesicular mass. The outer borders of the seminal vesicles are adherent to the lateral structures on both sides and several enlarged glands are felt in the left side next to the pelvic wall and also in the sacral fossa. The cystoscope shows a small sessile rounded median lobe. There is no subtrigonal thickening, but the median portion of the prostate is enlarged and quite hard. In this case the history and cystoscopic findings were against cancer, and the induration of the prostate was not typical, but the presence of indurated lymphatics and enlarged glands made one suspect cancer. At operation the prostatic tissue was firm and showed small yellowish dots and lines resembling cancer, but the microscope shows simply a chronic prostatitis, and the patient is well now one year after operation.

II (140). Began one and one-half years ago with burning during urination, frequency and difficulty, since then considerable pain and hematuria. The prostate is not much enlarged, smooth, moderately indurated, but not of stony hardness. The right seminal vesicle is not enlarged, but several hard cords are felt in this region and three or four enlarged indurated glands are present at the outer border along the pelvic wall. Cords are similarly present on the other side, and in the sacral fossa there is a small mass suggesting glands. The cystoscope shows a large, smooth, oval calculus, and moderate enlargement of the median portion of the prostate. With finger in rectum and cystoscope in urethra there is no subtrigonal thickening and only a moderate enlargement of the median portion of the prostate. At operation benign hypertrophy with prostatitis was demonstrated. The lobes enucleated easily.

III (131). Frequency of urination for 15 years. Considerable difficulty and hematuria. The prostate is considerably hypertrophied, smooth, firm, elastic, no areas of induration and no tenderness in the prostate. Extending upward and outward from the upper end of each lateral lobe is an area of induration in the region of the seminal vesicle which is particularly marked on the right. This induration is not of stony hardness, but is quite firm and irregular. No enlarged glands are present. An intervesicular plateau of moderate induration is present. The cystoscope shows a median lobe of considerable size. At operation a typical benign prostate, with considerable prostatitis present, was removed.

The Cystoscopic Findings.

The cystoscope was employed in 133 of the 145 cases. It was not used in the 12 cases for various reasons: in four because the operation was done away from home and cystoscopy could not be carried out, in three cases because suprapubic fistulæ were present, and a report was made as to the condition within the bladder, and in the other cases because the patients were too weak to be disturbed. In two cases cystoscopy was attempted but the instrument could not be introduced into the bladder. One of these cases had false passages in the region of the membranous urethra which prevented catheterization, and the second was a case of very great prostatic hypertrophy in which it was impossible to get the cystoscope over the median enlargement. In six cases cystoscopy was interfered with by hemorrhage so much as to render the examination unsatisfactory. In some other instances hemorrhage occurred, but not until late or not in sufficient amount to interfere with the examination.

The condition of the intravesical portion of the prostate, as shown by the cystoscope in the 125 cases in which satisfactory examinations were obtained, were as follows:

Median lobe.—Slight bar, 39; small round lobe, 37; moderate enlargement, 27; considerable enlargement, 14; great enlargement, two; huge enlargement, one.

Right lateral.—Not intravesically enlarged, 11; slight enlargement, 55; moderate enlargement, 28; consderable enlargement, 17; great enlargement, two; huge, one.

Left lobe.—No intravesical enlargement, 13; slight, 52; moderate, 25; considerable, 19; great, two; huge, one.

Anterior lobe.—Five cases.

Circular collar around the entire orifice, one case.

Intraurethrally projecting lobes.—Four cases.
Vesical calculi present.—Twenty-five cases.
Vesical diverticula present.—Seventeen cases.
Pouches and cellules.—Numerous cases.

In another portion of this volume so much space is devoted to the importance of the cystoscope as a diagnostic aid in diseases of the prostate that it will be out of place to discuss the question in detail here. The cystoscopic chart (elsewhere described) has been used in almost all of the cases and has proved invaluable in the interpretation of the many and peculiar forms of intravesical outgrowths of the prostatic lobes, and without its use I feel absolutely certain that it would have been impossible for me to interpret the findings in many cases. This is particularly true in the case of median lobes in which the cystoscope may lie either on top or in the sulcus to the right or the sulcus to the left of the median lobe, and in each position an entirely different and apparently contradictory set of pictures will be obtained unless elucidated by the method of charting spoken of above.

In regard to the findings tabulated above one is struck with the fairly large number of cases in which there is no intravesical enlargement of the lateral lobes shown. It not infrequently happens, especially if there is a small median lobe present to lift up the prostatic orifice, that the lateral lobes do not grow towards the bladder, but push upward into the region of the seminal vesicles so that on cystoscopic examination no intravesical enlargement of the lateral lobes is seen, although there may be a considerable enlargement of the lateral lobes found on rectal examination.

Another interesting finding has been that when one lateral lobe presented more prominently to the examining finger in the rectum the other lateral lobe would be found to present more prominently into the bladder with the cystoscope. This has been noted in a great many cases, and it seems evident that in the constricted space in which these enlargements are produced, occasionally one will be crowded posteriorly and the other anteriorly.

Median lobes.—One is also struck with the number of cases in which the median enlargement is only slight in degree. As noted above, in 37 cases the median enlargement was in the shape of a small globular, sessile or pedunculated median lobe. In many of these cases it was not more than 1 or 2 cm. in diameter, and yet the obstruction was often just as great as in some of the very great hypertrophies. In

39 cases the median enlargement was in the shape of a small transverse bar and on cystoscopic examination the instrument showed no sulci on either side, and it was impossible to get the triple set of pictures which can usually be obtained when the lobe is globular in shape with a deep sulcus on each side. In most cases this median bar was a distinct hypertrophy or thickening of the median portion of the prostate, but in a few cases it was a mere septum-like membrane which joined intravesically enlarged lateral lobes, and was apparently an artefact or fold of mucous membrane produced by the upward growth of the intravesically enlarging lateral lobes. In such cases it was often completely hidden behind the approximated lateral lobes, but on elevating the handle of the cystoscope so as to separate the lower portions of the lateral lobes the median fold was brought into view (cases 120, 5).

In 12 cases the middle lobe was considerable in size, in two cases great, and in one case huge. In the latter case the intravesical mass, which was composed of median and lateral lobes fused together, was about the size of a cocoanut, and completely filled the bladder (which was large). In two cases middle lobes the size of an orange were present, and in 12 cases from the size of a hen's egg to that of a lemon. In some instances these lobes were directed anteriorly, but in others they lay upon the floor of the bladder completely covering the trigone and in some cases much of the base of the bladder.

The lateral lobes.—As seen in the tabulation above, the right and left lateral lobes were about equally subjects of intravesical enlargement. As remarked above, in about a dozen cases there was apparently no enlargement towards the bladder of the lateral lobes, and this was so, not only in some cases in which the lateral lobes were small, but also in a few cases in which the lateral lobes were fairly large. In these cases the lateral lobes had grown laterally or posteriorly rather than intravesically. In one remarkable case, however (126), in which rectal examination showed the prostate very little larger than normal, and cystoscopic examination showed no intravesical enlargement of the lateral lobes (and also very little of the median), I was surprised to find at operation that the lateral lobes were quite large, but that their growth had been directed toward the symphysis pubis, so that they presented practically no enlargement posteriorly or intravesically. In this case the posterior capsule of the prostate was extremely thick and dense, and the vesical neck was also very

thick and firm, and admitted the index finger only after considerable pressure was made. I have no doubt that the firmness of the prostatic capsule in these two directions was responsible for the peculiar anterior growth of the lateral lobes described above. I have never seen this condition in any other case or any reference to it in the literature.

Anterior lobe.—In five cases a fairly considerable lobule was seen anterior to the urethral orifice, and so separated from the lateral lobes that it really presented as an anterior lobe overhanging the urethral orifice (50, 6, 120, 104, 65). The cystoscope, however, showed that the sulcus separating it from one of the lateral lobes was much deeper than that separating it from the other, and at operation a definite connection with one of the lateral lobes was determined in two cases, and the lobe was easily removed along with or after the lateral lobe through the lateral cavity. It cannot, therefore, be said that any of these cases presented a definite anterior lobe which was connected in no way with the lateral lobes and was entirely separate in its growth. I have seen one such case in the Museum of the Royal College of Surgeons, London, the enlargement being entirely of the anterior commisure of the prostate.

In one case (53) the anterior portion of the prostatic margin formed part of a definite collarette around the prostatic orifice and was undoubtedly definitely thickened, and in several cases in which the lateral lobes had grown out quite far into the bladder, I have seen the anterior margin of the prostate appear as a septum-like fold as happens also in the median portion posteriorly in certain similar cases, but a study of these cases shows conclusively that it is very rare indeed for the anterior portion of the prostate to furnish any obstructing enlargement, and, therefore, that the anteriorly directed incision which has been generally employed in the Bottini operation has had no pathological justification.

Intraurethral enlargements.—In two cases I discovered definite lobules projecting intraurethrally. One of these cases (82) has been described in full in the article on the use of the cystoscope in diseases of the prostate, case 21. The other case is given briefly elsewhere (case 119). In both of these cases when the cystoscopic prism was drawn outward beyond the vesical sphincter, lateral enlargements projecting toward the urethra were seen, and undoubtedly furnished considerable obstruction to the outflow of the urine.

It seems probable, however, that had it been possible to cystoscope the posterior urethra, as was done in these two cases, we would have found intraurethrally projecting lobules in a number of cases.

Vesical diverticula.—The cystoscope was not only of very great value in mapping out the character and size of the various prostatic outgrowths, but also in determining the condition of the bladder. In practically all cases more or less trabeculation of the bladder was found. In cases where the obstruction was apparently of recent origin the trabeculation was often not very great and was usually associated with a contracture of the bladder. In the older cases the hypertrophied muscle bundles were more prominent and there was more or less extensive pouch formation between them. In a number of cases, where the pressure had been considerable, the orifices of small intramuscular cellules were seen, particularly on the posterior and posterolateral aspects of the bladder. In 18 cases the presence of definite extravesical diverticula was made out. These occurred usually just external to one of the urethral orifices. Occasionally they were found in the vertex of the bladder in the region of the beginning of the urachus, and these three positions furnished by far the most common sites for their occurrence. Not infrequently diverticula were seen in all three locations. As remarked in the article on this subject in Vol. XIII of these reports, diverticula occurring in the region of the ureteral orifices are capable, not only of pressing upon the ureters and thereby obstructing the flow of urine, but also drawing the ureteral orifice into their cavities in their progressive enlargement. Such was the case in two of these cases, and it was on account of the fear of subsequent injury to the kidney and ureter, on that side, that I advised removal of the prostatic obstruction in one of these cases (143). In one case (30) a very large diverticulum was present and communicated with the bladder by a small orifice on the anterior wall slightly to the right of the median line. In this case it was possible to introduce the cystoscope through the orifice and carefully examine the interior of the diverticulum which was found to extend far backward along the lateral walls of the bladder and rectum as far as the sacrum. On account of the fear of serious complications which might follow infection of this large extravesical pouch I advised and carried out excision of the diverticulum suprapubically preliminary to perineal prostatectomy. This was the only case in which a very large diverticulum communicated with the bladder on the

anterior wall with such a small orifice, and in the other cases the diverticula were in such position or of such size that I did not fear the retention of septic products within their cavities, and was content to simply remove the obstructing prostate trusting that the diverticula would more or less completely collapse when all impediment to free urination was removed. This hope has been realized in practically all of these cases, notably one (82), in which five fairly large diverticula were present.

Deep intravesical pouches with prominent septa of mucous membrane adjacent were seen in several cases, particularly on the posterior wall of the bladder. Not infrequently a deep pouch was present behind a much hypertrophied and prominent ligamentum interureteric um, and in one case I have seen the latter form a very prominent transverse septum which divided the bladder transversely into an anterior and posterior portion and formed a marked obstruction to urination. But in the majority of instances septa, pouches, and diverticula give very little trouble after the prostatic enlargement has been removed.

Vesical calculi were discovered with the cystoscope in 23 cases. In one case seven calculi were present; in one case five; in one case four; in one case three; in four cases two; and in the remainder one calculus, were present. In three cases the calculi were quite large, but in the majority of cases they were only moderate in size. In all cases they were free within the bladder cavity and no case of encysted calculus or calculus in a diverticulum was seen although in several instances the bladder was considerably trabeculated with numerous intervening pouches and cellules.

In three cases the patient presented symptoms suggesting calculus, and the bladder was contracted and very irritable and occasional hematuria had been present, but in all of these there was very marked hemorrhage produced by attempts at cystoscopy so that an unsatisfactory view of the bladder was obtained, and no calculi were discovered. The bladder was also carefully searched but no calculi detected. At operation no calculi were found but I do not believe that a sufficiently careful search was made, for one of these cases has returned with two small calculi in the bladder and the other two cases have continued to suffer pain though less in degree than before operation. In the one case which has returned for operation the bladder contained numerous pouches, which explain the failure to find the calculi at operation.

In a number of these cases the knowledge that a calculus was present was of very great value during the operation for only by persistent searching with forceps and spoons were the calculi secured.

The advantage of cystoscopy in all cases of prostatic hypertrophy before operation is therefore very great as demonstrated in the cases mentioned above. Not only is the operator forewarned as to the presence of calculi or diverticula or intravesical tumors, but the accurate knowledge obtained as to the location, character, and size of the prostatic enlargements enables him to operate with a confidence of removing all the obstructing portions and with the least loss of time and mutilation of unobstructing parts. I cannot too severely condemn the obstinate refusal of certain operators to make use of this valuable and enlightened addition to our diagnostic measures.

C. PRELIMINARY TREATMENT.

In more than half of the 145 cases here reported the operation was done within three or four days of the examination of the patient after admission. In a few public ward cases the operation was delayed owing to the press of other work, and in several private cases the operation was deferred either to suit the convenience of the operator or the patient, but in only 41 cases was definite preliminary treatment thought to be advisable. It was carried out in these 41 cases for the following length of time:

4	days	5	Cases.
5	"	1	"
6	"	3	"
7	"	2	"
8	"	4	"
10	"	5	"
11	"	2	"
12	"	1	"
13	"	2	"
between 2 and 4	weeks	4	"
" 3 " 4	"	4	"
1	month	4	"
2	"	1	"
4	"	1	"
6	"	1	"
7	"	1	"

In five cases the patients were very weak old men, aged 77 (125), 78 (20), 76 (54), 81 (23), 82 (49). Four of these cases were treated

by continuous drainage with the catheter, four, eight, eight, and 24 days respectively. The fifth case, aged 81, was catheterized twice daily for four days and then aspirated twice daily for six days. In this case the bladder was greatly dilated, holding over 2000 cc., and this was the only case in which the operation was not successful. This patient died 30 days after the operation. The bladder did not regain its tone.

In 10 cases (20, 44, 118, 77, 136, 50, 107, 138, 23, 126) the patients had never been catheterized and there was a very large amount of residual urine present, in six cases being between 500 and 1000 cc. and in four cases between 1000 and 2000 cc. Eight of these cases were treated by catheterization from two to four times daily for periods varying from one to three weeks. One case was treated by continuous drainage through a catheter for eight days and one by intermittent catheterization followed by suprapubic aspiration for six days. In all, nine cases were treated by continuous drainage through a catheter retained in the urethra, and the remainder, with exception of one case of suprapubic drainage for seven months, were treated by intermittent catheterization, generally three times daily, occasionally only twice daily, and in three cases from four to six times daily. In five cases (53, 37, 89, 82, 58) strictures of the urethra were present, and dilatations were given for protracted periods varying from three weeks to several months. In one case (38) the operation was delayed eight days on account of epididymitis, which was treated by ice bags. In two cases (52, 109) marked symptoms of renal infection were present (nausea, vomiting, fever, etc.), and in one continuous catheterization was maintained for 10 days; in the other intermittent catheterization for four days. In neither instance was there any improvement in the uremia and it was thought best to supply perineal drainage at operation. Both of these patients died, 14 and 27 days respectively after the operation, of pyonephrosis and uremia. In one case (18) continuous drainage through a retained catheter was maintained for 10 days on account of severe urethral hemorrhages. In two cases (72, 85) the operation was delayed 10 and 18 days respectively on account of pleurisy. Two cases (51, 8) were treated for two and four months respectively on account of contracture of the bladder associated with chronic obstructive prostatitis with small median lobe enlargement, by urethral dilatations and attempts to dilate the bladder by hydraulic pressure, but without success. One case (75) had sugar

in the urine and was put upon antidiabetic diet for six days. During this time bicarbonate of soda and urotropin, water, catheterization, three or four times daily were employed. Eight cases (6, 1, 124, 117, 91, 132, 60, 74) were treated by intermittent catheterization for periods varying from four to 27 days. All of these patients were weak subjects, and four at least showed evidence of renal insufficiency. One had had hemiphlegia. All of these patients recovered and were cured by operation. One case (84), with a small sclerotic inflammatory prostate, 250 cc. residual urine and contracted bladder, was given local treatment as an experiment, viz., catheterization twice daily, irrigations, urotropin, and urethral dilatations for 12 days, but without benefit and operation was therefore decided upon. One case (67) had a considerably distended bladder, urine of very low specific gravity containing very little urea, nausea, and other symptoms of uremia. He was treated by catheterization, at times continuous and at other times intermittent for 43 days, and during this time the specific gravity of the urine improved steadily until it finally reached 1015 and operation was followed by perfect success.

In the 41 cases given in more or less detail above, the patient has nearly always received urotropin from 15 to 30 grains daily and water in abundance by mouth and sometimes by infusion or by enemata. In very few instances has liquid diet been employed.

During the past year the number of patients receiving preliminary treatment for three or four days has been considerably less than formerly, and the operator has become more and more impressed with the fact that it is not necessary in the great majority of cases. Where the patient is using a catheter regularly two or three times a day, the kidneys are in fair shape and the general health good, it seems entirely unnecessary to delay operation for any length of time. In cases with calculus present the sooner the operation can be performed the better it is generally for the patient. In patients who have never used a catheter, in good general health, with urine of fairly good specific gravity, with no definite evidence of more than slight change in the kidneys, and a residual urine less than 500 cc. only a few catheterizations are necessary as a rule before the operation. As soon as it has been demonstrated that anuria does not result in a given case after drawing off the urine, it is generally better to operate soon rather than expose the bladder to almost certain infection, when catheterization for a protracted period is carried out.

In patients with very large residual urine, who have never been catheterized previously and the urine sterile, we must decide between continuous drainage of the bladder through a retained catheter, and frequent catheterization for a protracted period (with the ever-present danger of vesical infection), and operation after only a few days catheterization, before infection of the bladder occurs. These cases are undoubtedly among the most dangerous with which we have to deal owing to the fact that the ureters and renal pelves are almost always greatly dilated, and the renal cortex correspondingly atrophied.

A study of these cases would seem to show that catheterization three times a day for a period of a week is generally sufficient to provide against sudden anuria, to cause a certain amount of contraction of the dilated ureters and renal pelves, and sufficient improvement in the urine to render operation safe, and if urotropin and water in abundance be taken, and great care observed in catheterization, the bladder can generally be kept free from infection. The best catheter to use is as a rule a French gum coudè catheter of medium size (16 to 18 F.) the Porgès make which can be sterilized by boiling before being used. Strict precautions, such as thoroughly cleansing the glans penis and the anterior urethra (by irrigation), and by irrigation of the bladder with boric acid solution after evacuation of the urine, should be taken.

In cases where marked evidence of poor kidney function, as in the case mentioned above (67), is present, it may be advisable to supply catheterization for a protracted period, and it is remarkable how great improvement in the character of urine will result.

In cases where the patient is uremic and definite evidence of severe renal infection is present, frequent catheterization or constant drainage along with hydrotherapy and urotropin should be tried. In several instances this has been entirely sufficient to relieve the renal infection and restore the patient to a sufficiently good condition for prostatectomy though in one of my cases (No. 2, carcinoma series) it was necessary to maintain continuous drainage for five weeks. Where the patient does not improve under this treatment it is difficult to say what is the best procedure to adopt. In two cases (52, 109) in which I performed perineal prostatectomy in order to supply better drainage, the patients finally succumbed to their kidney disease. Perhaps simple suprapubic drainage will prove preferable, but in my two cases the patients died 14 and 27 days after the operation, and not as a result

of it, and it is difficult to see how suprapubic cystotomy could have supplied better drainage. As long as certain physicians allow their patients to get into this desperate position just so long will there remain a certain number of cases with renal lesions too severe to admit of a cure of the patient by any means.

In conclusion I may say that prolonged preliminary treatment should rarely be necessary. Urotropin should usually be administered at once before cystoscopy is performed and continued through the convalescence after operation, but care should be taken not to produce stomachic irritation by it. Where the catheter has not been used and the amount of residual urine present is not very great (400 cc. or less), and the physical and urinary examination show no evidence of marked organic lesions, and in cases where regular catheterization is being performed several times daily, it is not necessary to wait for a protracted period before performing the operation. Where definite evidences of organic diseases are present, and where a very large amount of residual urine is present, in cases which have never been catheterized, a certain amount of preliminary treatment will be advisable as indicated above, but as a rule need not be protracted to any great length. Intermittent catheterization is in a way better than continuous drainage in that the bladder does not become contracted, but in cases with severe renal lesions continuous catheter drainage is generally more efficacious, and if the catheter be kept closed by means of a clamp which is removed at stated intervals to allow the escape of urine, vesical contracture can be prevented. The objection to continuous catheter drainage is the considerable urethral and vesical irritation which is often excited.

D. THE OPERATION.

Character of Technique.

The operation performed in 145 cases was in most all of the cases exactly in accordance to the technique described in another portion of this paper. Among the early cases, when the operation was in its developmental stage there were slight differences, *e. g.*, in the first case a transverse capsular incision was used; in the second case, after stripping back the posterior capsule the urethra was opened in the median line posteriorly. In the fourth case, however, the importance of preserving the ejaculatory ducts was recognized and since then the bilateral capsular incisions with preservation of the sub-urethral tissues immediately surrounding the ejaculatory ducts has

invariably been employed ,except in six cases. Four of these patients had lost their sexual powers, and two had been castrated, and the sub-urethral method of removing the median portion was employed.

The median skin incision was used only in one case and was found to be so inferior as regards the exposure afforded that since then the inverted V incision had been used. The fact that with the latter incision all of the operation is by blunt dissection except in the median line and exactly the same as would be employed with the median skin incision has convinced me that it is foolish to attempt to do the operation through a median incision, when with the inverted V-incision no more deep structures are divided and an infinitely better exposure afforded.

In one case a preliminary incision was made in the bulbous urethra and through this the tractor was introduced into the bladder. This was done with the idea of leaving the posterior urethra entirely intact, but a great objection was found to this method in that the prostate was drawn by the tractor, not toward the field of operation, but toward the triangular ligament, so that the exposure afforded was much less satisfactory and nothing like the same facility of making one particular portion of the prostate present for enucleation was obtainable.

It is evident that with a tractor inserted through the meatus the same objections, but still greater in character, would occur. Very early in the development of this operation I had a tractor made of extra length with the idea of introducing it through the meatus and thus avoiding any incision into the urethra, but I soon found that with this instrument the prostate would be drawn toward the symphysis pubis and away from the field of operation. The dependent drainage afforded by the urethrotomy in the membranous urethra is of very great value after the operation, particularly in those cases in which the bladder is badly infected and in which the freest possible escape for the urine is desirable owing to impaired kidneys. Another reason for the perineal drainage tube is that ocasionally a tear is made in the urethra and hemorrhage from the prostatic cavity escapes into the bladder, and unless continuous irrigation is afforded the tubes (or the urethra if not tube drainage is furnished) may become plugged with blood. I therefore consider the opening in the membranous urethra the best, not only on account of the excellent traction afforded, but the great value for subsequent drainage.

In four cases, owing to the absence of infection, no tube drainage for the bladder was furnished. In two cases the result was ideal in that the patient voided almost immediately through the urethra the bladder did not become infected, and the perineal fistula closed in six days. In the other two cases the urethra became plugged with blood and catheterization had to be employed, much to the discomfort of the patient and entirely vitiating the object of this method. I now invariably employ double tube vesical drainage through the incision in the membranous urethra. Continuous irrigation from a large tank of sterile salt solution is maintained until the morning after the operation. In cases where fairly abundant hemorrhage into the bladder occurs after the operation, it is necessary to have fairly free irrigation until the hemorrhage stops and all danger of plugging of the tubes with a clot of blood is passed. In most cases, however, after the first hour or two it is possible to clamp off most of the lumen of the tube leading from the tank so that it is very little trouble for the nurse to add warm salt solution from time to time sufficient to keep the irrigation going. In cases where the bladder is not infected great care has been taken to prevent infection, all tubes and solutions used being carefully sterilized, the exit tube ending in a bottle which contains a solution of bichloride of mercury, to prevent ascending infection from this receptacle.

In two cases the middle lobe was drawn into the urethra and there removed. In both of these cases the middle lobe was of a pedunculated character and difficulty was experienced in getting it to present into one of the lateral cavities. In the other median lobe cases it was always possible, either with the tractor, or with the index finger in the urethra to enucleate the lobe through one of the lateral cavities, and this latter method is much preferable in that the base of the middle lobe is much more completely removed, the mucous membrane is not usually disturbed, and the rather abundant hemorrhage, which sometimes follows its incision along with the middle lobe, is thus prevented. The ideal, which is to make no tear into the mucous membrane adjacent to any of the lobes, can very frequently be accomplished even in middle lobe cases, and in several instances I have been able to enucleate very large intravesical lobes without even tearing the mucous membrane covering them. In other cases small tears have been made and in very rare instances a small area of mucous membrane has been removed with the median lobe. Tears in

the lateral walls of the urethra have been a much more common occurrence, but in only two or three cases at most has any of the lateral walls of the urethra been removed, and the floor of the urethra and ejaculatory ducts have been preserved in all cases except those six cases mentioned above in which the suburethral portion of the prostate was removed intentionally (cases 55, 25, 145, 53, 77, 57).

It is interesting to note that three of these patients had epididymitis after the operation, of which two went on to abscess formation, and that two others had been castrated at a previous operation. These three cases prove conclusively that preservation of the ejaculatory ducts is of very great importance as a preventive of epididymitis.

Anterior lobes were drawn down into lateral cavities, and easily enucleated in five cases (50, 6, 120, 104, 65).

In two cases in which the irregular, almost villous, character of the intravesical portion of the prostate led me to suspect malignancy, an exploratory suprapubic operation was performed (96, 97).

In two cases (89, 82), associated with severe stricture of the urethra, a median perineal incision was added to the inverted V, and excision of the fibrous tissue in the region of the stricture carried out.

Vesical calculi were removed through the perineal wound after enucleation of the prostatic lobes in 23 cases. These cases are described at length elsewhere.

In one case (30) a large vesical diverticulum was excised through a suprapubic incision (but without going into the bladder) before the perineal prostatectomy was done.

Several accidents occurred during these operations. In four cases the orderly holding the staff in the urethra allowed the beak to slip out of the membranous urethra, and when instructed to introduce the instrument again through the sphincter, false passages were produced, so that the operator found the instrument outside of the membranous urethra. This acident, which is very disagreeable to the operator, should never occur if the orderly holding the instrument takes care not to allow the instrument to move from the position it occupies when entrusted to him by the operator. The only untoward effect of this traumatic rupture of the bulbous urethra that I have seen has been a difficulty in introducing the catheter after operation (in two cases requiring filiforms, but no definite strictures were produced).

In four cases (101, 103, 71, 42) a tear has been made into the rectum in exposing the posterior surface of the prostate. Two of

these cases (71, 42) had previously been subjected to perineal prostatectomy, there was a large amount of cicatrical tissue present, the rectum was very adherent to the prostate, and although great care was taken, the rectum was torn into. Both of these cases were carefully closed with layer sutures of fine silk, and one healed per primam. In the other two cases the rectum was quite adherent to the prostate and the operator endeavored to hasten their separation by the forcible use of his finger and the tear was thus made into the rectum. In both of these cases the suture of the rectum was successful. These two cases are very instructive in showing the importance of not attempting to forcibly push the rectum away from the posterior surface of the prostate with the finger in adherent cases. The handle of the scalpel is a much safer instrument, and if it is always directed along the posterior surface of the prostate and not towards the rectum no tear should ever be made into the rectal cavity. In some cases, owing to intimate fibrous adhesions, it may be necessary to use the scalpel or even to leave a small portion of the posterior surface of the prostate attached to the rectum. If these precautions are taken a tear should never be made, but one should always examine the rectum with a gloved finger inserted through the anus before final closure, as described in another portion of this paper. If this is done and the levators are drawn together with a single suture of catgut into their normal position in front of the rectum, rectal fistula should never follow.

The lateral wall of the urethra was intentionally excised in one case because the anterior portion of one of the lateral lobes contained a markedly indurated nodule which was slightly suspicious of carcinoma, but afterwards proved to be chronic prostatitis (128).

Operative Shock.

In only three of the 145 cases was there severe shock after the operation. These cases were performed under spinal anesthesia. One patient was 82, one 76, and the other 75 years old, and all were very weak subjects. In one patient the pulse was quite weak after the operation, but he reacted rapidly. In one case the respiration became very rapid after the operation. In one case there was a slight amount of shock. In all other cases there was absolutely no shock from the operation, the patient being in good condition when he left the table and after his return to the ward.

The surprising manner in which these weak old men, 21 of whom were over 75 years of age and five over 80, have stood this operation has been to me indeed very surprising not to say remarkable. Perhaps the fact that the patient has been made to drink water in abundance up to the time of operation and in frail subjects a submammary infusion of salt solution has been given on the table, has had much to do with the absence of shock. The position of the patient has, however, I believe much to do with it, as in the exaggerated dorsal or lithotomy position the blood pressure in the chest and head remains strong although fairly considerable hemorrhage may occur.

Spinal Anæsthesia

In 11 cases spinal anesthesia was employed (cases 49, 50, 16, 23, 55, 56, 54, 28, 25, 52, 33).

All of these patients were over 75 years of age except two and one of these was in desperate shape owing to pyonephrosis (52). Three cases were over 80 years of age. The reasons for employing spinal anesthesia were old age, very weak condition, the fear of existing renal impairment, and the desire to avoid pulmonary complications after the operation. As remarked above, the only cases in which there was severe shock following the operation were among these spinal anesthesia cases (16, 54, 28). The shock in these cases came on not during the operation but after removal from the table, and I cannot help but believe that it was in some way connected with the method of anesthesia as it has not been present in any cases in which ether has been employed. In fact one of the surprising results of this study of cases has been the demonstration that ether anesthesia could be employed with such perfect results in patients of great age, in weakened condition, many with severe renal disorders, cardiac lesions, emphysematous lungs, and otherwise unfit for general anesthesia as usually considered. The reasons for the absence of lung complications is I believe due to the elevated dorsal position which effectually prevents the passage of mucus into the trachea while the patient is on the operating table. I have yet to see a single case in which the ether has had any definite effect upon the renal secretion after operation. Perhaps this might occur did we not give submammary infusions either on the table or after return to the ward in every case, and follow these up by considerable dosage of water by mouth or by rectum,

where nausea is present. The result of this discovery has been that I have ceased to employ spinal anesthesia because I can see no objection to the use of ether.

Duration of Operation.

In performing the operation no great attempt has been made to work with extreme rapidity. The time consumed from the first incision to the tying of the last suture after placing the tube and gauze drainage has varied from 15 to 30 minutes, 22 minutes being about the average. An effort is made to give as little ether as possible, the patient being placed on the table as soon as anesthesia is complete and ether removed considerably before the end of operation.

I think it of much greater importance to do a careful operation, to obtain a good view of the prostate, to do no injury to the rectum, to carefully secure the edges of the urethral mucosa before attempting to insert the tractor and to see what you are doing, to be sure that all obstructing lobes have been removed and that no nonobstructing but important anatomical structure, such as the urethra and ejaculatory ducts, have been removed, than to try to make record time in each case. My statistics conclusively show that there is no reason why prostatectomy should not be done according to the dicta of modern surgery, and not blindly, blunderingly and barbarously, simply to save a little time.

Characteristics of the Prostatic Lobes Removed at Operation.

	No enlargement.	Slight.	Moderate	Considerable.	Great.	Very great.	Huge
Right	4	53	55	21	7	2	1
Left	4	57	50	21	8	2	1
Median	18	67	44	8	4	2	1
Entire intravesical portion	6	71	40	16	7	2	1

In the tabulation above, the four cases in which the lateral lobes were not at all enlarged were characterized by small median bar obstructions. In these cases the lateral lobes were removed (leaving however a fairly broad ejaculatory bridge) although it was possible that they were producing very little obstruction. It seemed best, however, to remove the three portions of the prostate in order to be certain of removing all obstructions. In two of these cases the erec-

tions have returned and one reports sexual intercouse entirely normal, the other has not attempted intercourse, and the third and fourth cases are now in the hospital. I mention these results as showing that there is no objection to removing the lateral lobes even if apparently not enlarged, and in order to thoroughly expose the median bar it is important that this should be done.

In the above statistics the statement that no enlargement of the median lobe was present is misleading. It should read that no portion of the median lobe was removed at operation in 18 cases. This differs so markedly with the cystoscopic finding, given in another part of this paper, in which only four cases without any enlargement of the median lobe are recorded that some explanation is necessary.

In four cases (11, 120, 64, 5), although the lateral lobes were quite considerably enlarged, the cystoscope showed no median enlargement, and this was confirmed by the operation and none of the median portion of the prostate was removed. The result has been excellent in all of these cases. In four cases (23, 43, 48, 49) the cystoscopic examination was not satisfactory on account of hemorrhage, but in three of the cases the result has been excellent, so that apparently there was very little median obstruction present. In the fourth case, one in whch it was impossible to introduce the cystoscope through the posterior urethra, examination at the time of operation showed apparently no enlargement of the median enlargement worthy of removal and in view of the age of the patient (81 years) it was thought unwise to prolong the operation. The patient lived 30 days and died of general weakness and hypostatic congestion of the lungs, but his bladder did not functionate properly and it was necessary to drain it with a catheter. Owing to the fact that the bladder was dilated (with over 2000 cc. residual urine before operation) it was impossible to say that atony of the bladder was not the chief cause of failure to evacuate urine, but I believe that there must have been some obstruction in the median portion of the prostate which, although slight, should have been removed. In the remaining 10 cases (50, 10, 8, 83, 126, 94, 3, 47, 15, 36) although the cystoscope showed a small median bar, after removal of the lateral lobe examination of the median portion seemed to show that there was not sufficient enlargement in this region to cause obstruction, and as it was impossible to make this portion present into one of the lateral cavities with the tractor it was thought unnecessary to split open the urethra and excise this

median portion. Accordingly nothing was removed from this region. The results obtained in six cases show that this decision was entirely correct, but in the first five cases mentioned above there is a question whether the results obtained might not have been better had the median portion been excised. One of these patients although relieved of the complete retention, from which he suffered before operation, complained of severe pain in the wound during the three weeks he lived after operation (83). One case (50) had an atonic over distended bladder with 1100 cc. residual urine before operation and the residual is now 300 cc. and the cystoscope shows a small median bar, so that I do not believe the obstruction was completely removed. The other two cases consider themselves greatly improved but suffer from slight frequency of urination.

Another case (126) who also had a very large residual urine (940 cc.) now had 150 cc. residual urine although he does not get up at all at night to urinate and micturition is normal.

Although there is definite evidence of residual urine after the operation in but three cases, all of whom had about 1000 cc. residual urine and very weak atonic bladders before operation, I feel certain that even better results might have been obtained by the routine removal of the median portion of the prostate in these cases although it did not seem enlarged at operation, and in the future this shall be my practice.

A review of the cases in which the lateral and median portions removed at operation were *slight* shows many very severe cases of obstruction. A large number of these patients had complete retention of urine and depended entirely upon the catheter, and in others catheterization was necessary owing to a large amount of residual urine and great difficulty and frequency of urination. In this class there were probably more cases of contracture of the bladder and small residual urine, and more cases associated with calculus than among the large prostates, but in every case operated there was definite evidence of serious obstruction present and the excellent results obtained show the wisdom of intervention. In these cases of slight enlargement of the lateral lobes I usually found very little difficulty in removing the lateral lobes each in one piece. By making the initial capsular incisions deep the lobes are easily freed from the urethra and no difficulty is experienced in separating them from the capsule, but the vesical end of each lobe is often quite adherent and in

some cases cannot be enucleated with the finger, in such cases I have found the use of broad sharp periosteal elevator of considerable use in freeing the deeper portions. In the case of a very small median lobe, when pedunculated it has usually been an easy matter to cause it to present into one of the lateral cavities with the tractor or the finger in the urethra, but in the case of a small fibrous median bar it has occasionally been necessary to split the urethra along one of the lateral walls and, thus exposing the median portion of the prostate, to grasp it with tooth forceps and excise it with its mucous covering through the lateral cavity and urethra combined. Several recent cases (133, 137, 143, 141) have shown the importance of this method of technique. Whenever it has been impossible to engage the median portion of the prostate with the tractor, and the index finger meets with a firm cicatricial ring around the prostatic orifice, although no enlargement may be evident it is extremely important that the median portion should be excised to prevent the continuance of obstruction as in case (126). By the technique mentioned above the ejaculatory ducts are not disturbed and only a small bit of mucous membrane at the vesical orifice is removed. The absence of epididymitis following the cases operated upon by this technique and its presence in all cases in which the suburethral method was used, show conclusively that the former is greatly to be preferred.

As regards the cases of moderate hypertrophy there is little to be said. The enucleation especially of the median portion has nearly always been easier than in the cases of slight hypertrophy. As seen in the above table these cases form about one-third of the entire number of prostatic hypertrophy and along with the cases of slight enlargement form about 70%.

In the cases described as considerable enlargements it is noticed that the portion affected was more commonly the lateral than the median, and the same is true with the great hypertrophies. In one case (11) in which there was a considerable hypertrophy of each of the lateral lobes, there was no enlargement at all of the median portion of the prostate, the intravesical portions of the lateral lobes being flattened against each other like two halves of an orange. The urethra in this case was about 5 cm. wide.

Seven cases (65, 96, 20, 29, 122, 13, 114) have been classed as great enlargements. In these cases there was an involvement of both lateral and median portions of the prostate in an extensive intra-

vesical outgrowth. The weight of tissue removed in these cases varied from 80-G to 100-G.

Two cases (109, 72) have been classed as very great hypertrophies. Here also all three portions of the prostate were involved, forming a very large intravesical mass, the tissue removed weighing 150 and 145-G.

In one case (16) the prostate has been classed as huge, the intravesical portion of the prostate forming a mass about 9 cm. in diameter and weighing when removed 240-G. In none of these cases, although the prostatic enlargement was largely intravesical and of great size, was any special difficulty experienced in enucleating the prostatic lobes through the perineum, in fact the operation was, in many cases, much easier than some of the small fibrous prostates. In most cases the lateral lobes have been removed each in one piece and the median lobe in one or two pieces, though in some instances they have come away in several large lobules. In the case weighing 240-G. the prostatic mass was so large that it could not be drawn between the ischiopubic rami and the tractor was so small that it would not take hold upon the huge intravesical mass after a portion had been removed. It was necessary to draw down large lobules with forceps and enucleate them separately. Had the patient been under general anesthesia abdominal pressure would have been a great assistance in this case, but he would not allow it. In nearly all other cases of the great hypertrophies the ordinary tractor has been entirely sufficient to engage and draw down the intravesical portions, but in two cases of very large pedunculated median lobes it was necessary to introduce the finger into the bladder through the urethra for assistance in the traction.

A review of these cases show conclusively that even the very greatest intravesical prostatic enlargements can be removed through the perineum with ease and without destroying the ejaculatory ducts or removing more than a very small part of the mucous membrane covering the median lobe. At one time I was of the opinion that cases of this character would be unsuitable for perineal operation, but I am now convinced that complications of a different character must be present before it can be said it is advisable to attack the prostate through the suprapubic route. The convalescence in these cases has been very satisfactory, the results obtained excellent, and

they furnish, I believe, the strongest evidence of the great advantages of the perineal route as a routine operation for the removal of obstructing prostates regardless of their size.

Operations in the Presence of Vesical Calculi.

Vesical calculi were present in 25 cases (23, 29, 32, 33, 36, 45, 47, 48, 62, 66, 70, 81, 83, 85, 92, 94, 101, 104, 114, 115, 116, 122, 135, 140, 144).

In 13 cases one stone was found, in five cases two stones, in three cases three stones, and in one case each four, five, seven, and "several" stones. In most cases the stones were not very large, and in several cases quite small. In two cases (47 and 140) the stones were quite large. In one of these, although the stone was a rough spiculated oxalate calculus, the patient had been almost entirely free from pain.

In one case (115) the calculus was quite small and was apparently lost in a blood-clot which was removed from the bladder in searching for the calculus. It seems probable that it was removed since the patient has had an excellent result and cystoscopy is negative.

In case No. 114, although a large calculus had been distinctly seen with the cystoscope, repeated attempts by the writer and his assistants failed to find it at operation, although prolonged searchings were made, and the wound was closed without removing the calculus. The search had been so careful that I felt sure the cystoscope had deceived me. The patient returned several months later complaining of pain and the cystoscope again showed a very large calculus, which was removed suprapubically.

I believe the failure to find the calculus was due to the fact that its large size made it difficult to encompass with calculus forceps, and a coating of blood prevented us from obtaining crepitus with the instruments. I do not remember whether a search was made with a finger inserted through the urethral orifice into the bladder. Such a procedure should have detected the calculus in a contracted bladder. At any rate it was an unpardonable mistake to desist without finding the calculus when it had been so clearly seen with the cystoscope.

In the other cases no difficulty was encountered in extracting calculi through the perineum. When they were small they were sometimes removed through the prostatic urethra without tearing its walls. In a few other cases it had to be dilated before forceps could be introduced or calculi removed.

In most instances, however, it was thought best to divide the urethra along a lateral wall thus throwing the urethra and the capsular space on that side into a common cavity (as described in the chapter on operative technique) through which it was an easy matter to remove calculi 5 or 6 cm. in size. In only one case was it necessary to do more than dilate the vesical orifice, and in this case (47) a short incision was made through the vesical wall which was brought well into view by traction with the stone grasped by the forceps. By making a longer incision a much larger calculus could have been removed.

I therefore feel justified in saying that the presence of even very large calculi should not, as a rule, be considered a contraindication to perineal prostatectomy.

The markedly lower mortality shown by the perineal route in these cases (see another article in Volume XIII on perineal lithotomy) is a strong argument for adoption of the perineal route when stones are present, unless they be within diverticula with small orifices.

E. THE CONVALESCENCE.

In the preceding chapter we have described the way in which the patient reacted after the operation. The subsequent convalescence has in the vast majority of cases been remarkably simple and rapid. In all but three cases (barring the fatal and rectal fistula cases) the patient was out of bed within a week. As a rule the patient was put in a wheel-chair on the second or third day after the operation and carried out on a veranda, and within a week most patients have been walking about the ward. During the past two years it has been my custom to remove the gauze from the wound on the morning after the operation, and the tubes have been removed on the same day or the day following. Since following this custom the rapidity of the convalescence has been remarkably better, and the fistulæ have closed much more quickly. For example, in 40 cases operated on in the two years from 1902 to May 25, 1904, there were 11 cases in which the fistula persisted more than two months. Whereas, during the two years, 1904 to 1906, 105 cases have been operated on with only nine cases in which the fistula persisted longer than two months. The same thing is true in regard to the length of stay in the hospital. In 1902 to 1904, out of 40 patients 12 remained in the hospital

over 50 days; whereas, in the 12 months, June, 1905, to June, 1906, among 50 cases there was no one in the hospital as long as 50 days, and only two cases over 40 days. Fifty per cent did not remain longer than 22 days, and two cases left within two weeks after the operation.

In seven cases the urine began to flow through the anterior urethra on the second day, in four cases on the third day, in 10 cases on the fourth day, in 15 cases during the second week, in 12 cases during the third week, and in one case during the fourth week. In the great majority of cases urine passed through the penis during the first week, and inside of two weeks there was only a slight escape of urine through the perineal fistula.

Interval urination with fairly good control has been established remarkably early in the convalescence. In four cases in which no drainage tubes were used the patient had control at once and voided urine at stated intervals beginning immediately after the operation. In six cases in which tubes were employed, voluntary urination at intervals was established on removal of the tubes on the second or third day. The same thing probably occurred in many other cases, but unfortunately accurate notes on this point have been kept in only a comparatively small number of cases. In 16 other cases, in which notes have been kept, interval urination was established between the third and eighth day, and although the patient did not void all of the urine through the meatus he has been able to retain urine for a definite period and frequently has employed a commode rather than allow the urine to escape into the perineal dressings. The latter plan has added considerably to the comfort of the patient as the presence of dressings wet with urine is always a source of annoyance.

The establishment of early control and voluntary urination shows conclusively that in the operation which I have employed the vesical sphincter is not greatly injured, and this fact has been frequently demonstrated at operation, when after the removal of even large median and lateral lobes an examination with the finger has demonstrated the vesical sphincter entirely preserved, though often dilated. The fact that the entire operation is done between the external and internal sphincters without destroying either explains, I believe, the reason why incontinence never follows this operation, whereas it occasionally follows suprapubic prostatectomy in which the internal sphincter is considerably injured, and perineal prostatectomy through the ordinary

perineal section in which the external sphincter is divided and often considerably lacerated.

During the period in which the fistula is small but still open there is a marked difference in the comfort of the patient in perineal and suprapubic prostatectomy cases. In the former the urine is voided at intervals through the urethra at which time a small amount escapes through the perineal fistula, but by using the water-closet the patient is able to avoid any soiling of his clothes and it is unnecessary to wear absorbing dressings, whereas in the latter the urine constantly escapes through the suprapubic fistula generally until its final closure which is usually longer delayed than in perineal prostatectomy cases.

Complications During Convalescence.

Epididymitis occurred as a sequel to the operation in 20 cases. In 15 cases it was slight and it involved only one testicle in all but two cases. In many cases it was merely a slight transitory enlargement of the epididymis which was moderately tender and rapidly disappeared under applications of ice and in several instances without any treatment. In five cases the inflammation went on to abscess formation and required incision after which it promptly healed. In the 50 cases operated on during the past year epididymitis has occurred six times, in all cases slight and not requiring operative interference. As remarked before, three of the cases of epididymitis were in the cases in which the suburethral method of removing the median portion of the prostate was employed. Excluding the atypical cases we have then 138 cases in which the typical operation was employed with epididymitis as a complication in 16 cases (in three of which abscess formation occurred), 12%. This corresponds exactly to the figures for the past year.

When we consider the fact that 20% of all the cases had had epididymitis before coming to the hospital, and that those cases coming on after operation occurred usually during the second or third week of the disease we see how little the operation had to do with it. The fact that it occurred in all cases but one in which the ejaculatory ducts were removed shows conclusively that the conservation of these ducts is of very great importance as a preventative of epididymitis.

Suppuration of wound.—The sutured portion of the wound became infected and partially broke down in three cases and completely broke

down in three cases. In the other cases although the packed portion of the wound became infected from preexisting cystitis the sutured wound healed by first intention. This has been to me one of the most remarkable findings after this operation, for it seems wonderful that wounds could heal so well when immediately adjacent to an abundant infection and suppuration, and the contrast between these cases and those in which suprapubic prostatectomy was performed is very great. Since it has been my practice to remove the gauze on the day after the operation and the tubes on the second day the wounds have healed much more rapidly.

Post-operative hemorrhage occurred in four cases, in two on the second day, after removal of the gauze and in both cases of moderate degree and readily controlled by repacking the wound. In one case (89) severe post-operative hemorrhage occurred from an extensive vesical ulcer which had been curetted at operation, and resulted in death on the eighth day. In one case (9) there was moderate hemorrhage on the night after the operation and an assistant thought it necessary to forcibly pack the wound with gauze. As a result necrosis of the rectal wall followed. It may be remarked here that a certain amount of hemorrhage may always be expected after the operation, and one should not be surprised if it is more abundant than he is accustomed to see, especially in operations where it is possible to ligate all bleeding points.

As a rule the irrigation fluid comes away slightly stained with blood for several hours and in cases where the mucous membrane covering a median lobe has been lacerated in its removal, there may be fairly abundant hemorrhage, but a hot irrigation will generally cause a cessation of the bleeding. As a matter of fact hemorrhage has not been a matter of alarm in any but the single fatal case mentioned above.

Recto-urethral fistulæ followed the operation in seven cases and are discussed at length in another paper in this volume.

Phlebitis of the veins of the thigh occurred in two cases. Purpura in one case, pleurisy in one case, cholecystitis in one case, severe pain in the back which had been present before operation persisted after operation in one case (130). In one case the exit tube became blocked in some way and the scrotum became distended with salt solution, and two small incisions were required to evacuate it. The patient (139) made a satisfactory convalescence, and although a weak old man, left the hospital on the 29th day.

In two cases internes failed to remove a portion of the gauze packing, in one case, until the fifth week (12). In the other case (7) all of the gauze was thought to have been removed and the patient was discharged on the 20th day. The fistula closed on the 30th day and the patient had no discomfort with exception of a urethral discharge until five months later when a perineal abscess formed. After that a perineal fistula persisted. An operation was performed 10 months after the prostatectomy in order to close it, and greatly to the surprise of the operator a large piece of gauze was found within one of the prostatic capsules. After that the perineal fistula promptly healed.

Stricture of the urethra.—I have yet to see a definite case of stricture of the urethra following this operation, and I see no reason why one should occur. The small linear incision which is made in the membranous urethra back of the sphincter should never lead to the formation of stricture as the coaptation of the two edges of the wound should restore the urethra to its normal caliber.

In one case (25) in which the floor of the urethra was removed along with the median portion of the prostate (by the suburethral method) the patient's physician reports that he found a stricture which was easily dilated with sounds. In two cases in which rupture of the bulbous urethra has been produced by an orderly holding the urethrotomy staff, some difficulty has been experienced in passing a catheter after the operation, but no definite stricture has been present. As stated elsewhere, I have not found it necessary to pass sounds after the operation, and in no cases, except the one mentioned above have they been employed. In fact I believe it is very important to avoid instrumentation, and usually pass no instrument except a small silver catheter to determine whether any residual urine is present on the departure of the patient, and in many cases in which urination is apparently normal as regards interval and force of stream and there is every evidence that the obstruction has been removed, I have not even passed the catheter.

In conclusion I may say that the convalescence even in the serious cases is usually a very simple and rapid affair. With the use of an infusion after the operation and copious imbibition of water beginning as soon as possible, early purgation, getting the patient out of bed as soon as possible, and the early removal of gauze and tube drainage, the patient is usually walking about the hospital and voiding urine at

stated intervals declaring that he feels well enough to leave at the end of the first week.

Length of Time in Hospital.

The following table gives the duration of the time during which the patient remained in the hospital after operation.

4	cases	between	10	and	14	days.
20	"	"	15	"	19	"
36	"	"	20	"	24	"
25	"	"	25	"	29	"
16	"	"	30	"	34	"
5	"	"	35	"	39	"
9	"	"	40	"	49	"
6	"	"	50	"	59	"
12	"	over	60			"

Fifty per cent of the cases left the hospital within 25 days after the operation, and only 21% remained longer than one month. Thirty-two cases remained in the hospital longer than 35 days. Many of these were very weak patients, in poor condition before the operation, who convalesced slowly. In five cases the cause of delay was a recto-urethral fistula. In five cases it was due to the presence of a suprapubic fistulæ which was difficult to heal. In nine cases it was due to epididymitis, in three of which abscess formed and incision was necessary. In seven cases it was due to a tardy closure of the perineal fistula, in two cases to old stricture of the urethra which required dilatation. In one case each to cholecystitis, tabes dorsalis, a burn from a hot-water bag on the leg, a fragment of calculus left in the bladder, and a piece of gauze packing left in the perineum for four weeks. In one case (50) the patient remained in the hospital 37 days owing to an imperfect result, there being 200 cc. residual urine present which caused urine to be voided at intervals of two hours.

A review of these cases shows that the delay was due in many cases to causes not attributable to the operation, such as previous suprapubic fistulæ, stricture of the urethra, cholecystitis, tabes dorsalis, gauze left in the wound, a burn on the leg, in all eleven cases. There was also one case of suppurative epididymitis which was present before operation and which was the cause of the patient remaining in the hospital for 39 days (61).

In the remaining 20 cases the prolonged stay was due more or less

directly to the operation, the most important of which was recto-urethral fistula, but since the technique has been modified so as to include an approximation of the levator muscles this complication has disappeared, and during the past year in 50 cases we find only six cases have remained longer than 35 days.

Closure of the fistula.—The following table shows the time of closure of the perineal fistula:

4	cases	between	5	and	9	days.
21	"	"	10	"	14	"
31	"	"	15	"	19	"
17	"	"	20	"	24	"
7	"	"	25	"	29	"
7	"	"	30	"	34	"
3	"	"	35	"	39	"
6	"	"	40	"	49	"
1	"	"	50	"	59	"
13	"	over	60			"
17	"	fistula closed but time not noted.				
6	"	" still open. (2 recent.)				
10	"	died before closure of fistula.				
2	"	operated during the past 3 weeks.				
Total 145	"					

As stated above there are present only four cases of permanent perineal fistulæ. One of these patients (26) had a recto-urethral fistula after the operation for which two subsequent operations were performed (not the most recent method, however). There is present now a pin-point urinary fistula through which only occasionally a few drops of urine escape. The second case (12) is the one in which a piece of gauze was discovered in the wound four weeks after the operation. A pin-point fistula now persists through which only two or three drops of urine escape during each urination. In both of these cases the patients suffer no discomfort and refuse treatment for the fistulæ. The third case (14) is one in which I operated for Professor Casper in Berlin. He reported one year later that a minute fistula was present through which a small amount of urine escaped during urination. The fourth case (44) is one in which the median portion of the prostate was not completely removed, and 400 cc. of residual urine are still present. The fistula is minute and only a small amount of urine escapes through it during urination. In two

cases (122, 136) the operation was performed six and two months ago respectively, and the fistulæ are healing under treatment.

Among the 10 patients who died before closure of the fistula three (55, 24, 107) lived 5, 12, and 10 months, respectively, after the operation and died, two of accident and one from pyonephrosis. In these three cases small perineal fistulæ were still present. The other seven cases died from 8 to 31 days after the operation, and their histories are given in detail later on (see mortality).

In the two cases which are still in the hospital the fistula has not healed, but a month has not yet elapsed.

In 17 cases the fistula closed shortly after leaving the hospital, but unfortunately we have been unable to learn exactly when the final closure occurred.

As remarked above, fistulæ cannot be considered complications of any moment after perineal prostatectomy. In 62% of the cases the fistula has closed within 24 days after the operation, and during the past year in the 50 cases operated it was closed within 24 days in 75% of the cases. The fistula at the end of two weeks has usually been only a very small affair through which a little urine would escape during urination, and those which have persisted longer than 24 days have been of pin-point size, allowed the passage of only a few drops of urine, and have not been enough to cause the patients more than slight annoyance. There has been no case of perineal fistula in which there has been a continous leakage of urine, such as is present in nearly all cases of suprapubic fistula until the very time of final closure.

The persistance of the fistula has usually been due to suppurative conditions in the urinary tract and perineal wound. In many of these cases the bladder infection has been very great, and this condition has been communicated to the perineal wound and led to the formation of unhealthy granulations. In two cases urethral strictures were responsible for the delay in the closure of the fistulæ, and in cases where the rectum has broken down the perineal fistulæ have always persisted until the rectum was closed. The employment of suprapubic drainage in these cases has been followed by a prompt closure of the perineal fistula.

In many of the cases in which the fistulæ were slow in healing, the patient has left the hospital too soon and has not received appropriate

treatment after return home. With the exception of one case (41) I have been able, in every instance, to hasten the closure of fistulæ by occasional curettage with the gimlet curette (Fig. 39[1]) and applications of nitrate of silver.

F. IMMEDIATE RESULT OF OPERATION. CONDITION ON DISCHARGE.

Voluntary urination was established in every case by the operation. On discharge from the hospital there was not a single case that required catheterization, although on entrance the catheter was necessary in 134 cases, 64 of whom had complete and 70 incomplete retention of urine.



FIG. 39[1].

This restoration of the power of voluntary urination in every case is indeed remarkable when we consider that in 21 cases there were over 500 cc. residual urine present, in five cases over 1000 cc., and that one patient had used the catheter for seven years, two for eight years, one for nine years, and one for 14 years, the retention of urination being complete during these periods.

In 98 cases the fistula was completely closed on discharge of the patient from the hospital; in fact it has been my practice to try to keep the patient in the hospital until the fistula closed. In 39 cases the fistula was open when the patient left the hospital, but in 31 of these cases it has since closed. In eight cases the fistula is still open, but four are recently operated cases.

In the majority of cases the condition of the patients were so good that they were allowed to go home without being catheterized after the operation, and the subsequent history shows excellent final results in all these cases. Two cases with vesical contracture and cystitis left without our consent on the 14th and 22d days without having been catheterized, and in both of these cases the ultimate results have not been satisfactory (46, 51).

In 59 cases record has been kept of the finding with a catheter passed immediately before departure of the patient, as follows:

0	cc.	residual	urine	.....	34	Cases.
10	"	"	"	.....	8	"
20	"	"	"	.....	5	"
30	"	"	"	.....	2	"
40	"	"	"	.....	5	"
50	"	"	"	.....	2	"
75	"	"	"	.....	1	"
100	"	"	"	.....	1	"
110	"	"	"	.....	1	"
150	"	"	"	.....	1	"
200	"	"	"	.....	1	"

As remarked above, when we consider the number of patients who led catheter lives and the frequent presence of extreme vesical distention it is indeed remarkable that there were only 12 cases in which 40 cc. or more residual urine was found on discharge, the examination generally occurring within two or three weeks after the operation. These cases demonstrate well the wonderful power the bladder has to resume its normal functions when obstruction is removed even though it may have been dilated to three or four times its normal capacity, markedly altered by inflammation, the formation of diverticula, and the presence of calculi and although it had been evacuated only by catheter for many years.

In order that we may arrive at some conclusion as to the cause of residual urine in the 12 cases in which 40 cc. or more was present, and the subsequent course of these cases I will give each in brief detail.

Case I (17).—40 cc. R. U. on discharge. Over distention of the bladder with incontinence. Catheterization for two weeks. Residual urine 500 cc., small prostate with small globular pedunculated median lobe. Total weight 15-G. Microscopically, chronic prostatitis. On discharge from the hospital on the 22d day voided urine at intervals of four hours, fistula closed, condition excellent. Report 31 months after operation. Urination free, five times during the day and twice at night, often a pint at a time. " I am cured."

Case II (95).—40 cc. R. U. on discharge. Catheter life for two years, bladder capacity 600 cc. Moderate enlargement of lateral and median lobes. Weight of prostate 20-G. Fistula closed 15th day. Discharged 20th day with urination normal at intervals of five hours. Report 12 months later. " Perfectly cured. Void urine naturally and only rarely get up at night."

Case III (48).—40 cc. R. U. on discharge. When admitted urination was every 15 minutes with great pain. Bladder irritable, small, several calculi present. Prostate moderately enlarged. The lateral lobes were removed, but the median portion was not. The fistula closed on the 27th day, patient discharged on the 34th day voiding naturally at intervals of five hours. R. U. 40 cc. B. C. 210 cc. Report 20 months after operation. "In perfect health; urination natural; retain urine from three to five hours."

Case IV (114).—40 cc. R. U. on discharge. When admitted catheterization was necessary every six hours. Considerable enlargement of prostate. A large median lobe and a large calculus seen with the cystoscope. Perineal prostatectomy. Removal of three large lobes weighing G-80. A very careful search was made for the calculus but it could not be found. Thinking that the cystoscopic examination was erroneous the wound was closed. The convalescence was very satisfactory; the patient was discharged on the 14th day, no stone could be detected with a silver catheter. The bladder capacity was 230 cc., R. U. 40 cc. Cystoscopy would not be permitted. Six months later the patient returned complaining of pain, cystoscopy showed a large calculus which was removed by suprapubic route three weeks ago. At the prostate orifice was a small fold of mucous membrane in the median portion.

Case V (103).—55 cc. R. U. on discharge. Catheterization required for three months. A slight enlargement of the prostate was present. Three small lobes were removed weighing G-15. Discharged on the 34th day, voiding urine at intervals of three hours. Report 11 months later. "I am cured. Void naturally, once during the night, 15 ounces at a time."

Case VI (45).—50 cc. R. U. on discharge. Complete retention of urine for three weeks before admission. Moderate enlargement of prostate with small median bar, four vesical calculi, which were removed at operation along with a small median bar and small lateral lobes. Discharged on the 21st day in good condition, voiding urine at intervals of four hours. Report by letter 15 months later. "During the night I can sleep for four hours without urinating, but during the day I suffer pain and void very frequently, and have a feeling as if a gravel was trying to pass."

Case VII (41).—40 cc. R. U. on discharge. Catheter life three months. Residual urine 500 to 800 cc. Small median lobe and moderate lateral lobes removed. Fistula closed in 10 days, discharged in 24 days, urination normal, at intervals of four hours. Residual urine 40 cc. Bladder capacity 300 cc. Report 22 months after operation—letter. "I am cured. I void three times during the day and once at night without difficulty or pain."

Remarks.—A review of the seven cases above in which the residual urine on discharge was from 40 to 55 cc. shows excellent ultimate

results in all but two cases. In case IV the failure to remove the calculus was apparently responsible for the residual urine, frequency of urination, and pain., In case VI the present symptoms point to stone in the bladder, perhaps a recurrence since the operation, but possibly due to the failure to remove all the stones at operation. The fact that the patient is able to retain urine for four hours during the night and voids without difficulty seems to show that the obstruction has been completely removed.

Five cases in which the residual was more than 55 cc.:

Case I (107).—75 cc. R. U. on discharge. Dribbling of urine for one year. Over distended bladder with 1100 cc. residual urine. Removal of moderate enlargement of median and lateral lobes. Discharged from hospital on the 40th day, voiding urine freely at intervals of five hours. The fistula did not close. Report two months after the operation. "The fistula is present. Urine is voided naturally but with little force, three times during the day and four times at night. The catheter is not necessary." The patient was killed in an accident 10 months after operation.

Case II (37).—100 cc. R. U. on discharge. Prostatic trouble 12 years. Multiple vesical diverticula, small median lobe. 180 cc. residual urine, contracted bladder. Three very small lobes were removed. The patient improved rapidly and was discharged on the 18th day voiding urine at intervals of three and one-half hours, but the catheter showed 100 cc. residual urine. On examination 23 months later 30 cc. residual urine was obtained by catheter. The cystoscope showed a small median fold and the diverticula still present but smaller than before operation. The bladder was contracted, holding only 150 cc. Under treatment it was dilated up to 325 cc. and after a month's treatment, patient voided urine twice at night and four times during the day.

Case III (64).—110 cc. R. U. on discharge. Complete retention of urine, over distended bladder, capacity 800 cc. Cystoscope showed a slight median bar, but at operation only the moderately enlarged lateral lobes were removed. The fistula closed on the 10th day and the patient was discharged on the 16th day, voiding urine freely at intervals of four hours during the day and seven hours at night. R. U., 110 cc. B. C., 310 cc., no discomfort. Report 18 months after operation. "Urination normal, three times during the day and twice at night, but I drink much water. Consider myself completely cured."

Case IV (126).—150 cc. R. U. on discharge. Over distended bladder. R. U. 940 cc. Cystoscope showed a slight median bar which was not removed at operation. Moderately enlarged lateral lobes removed. Rapid convalescence. Fistula closed 16th day, discharged 21st, voiding urine freely at intervals of five hours. The catheter showed 150 cc. residual urine. Report four months later. Has improved steadily. Urination four

times during the day, none at night, micturition normal, considers himself entirely cured. The catheter shows 150 cc. residual urine.

CASE V (50).—200 cc. R. U. on discharge. Over distended bladder, 1100 cc. R. U. Cystoscope showed small median bar, and a prominent anteriorly projecting left lateral lobe. At operation the lateral lobes were removed, but the median bar was not. The patient convalesced well and on discharge from the hospital on the 37th day voided urine at intervals of five hours. The catheter showed 200 cc. R. U. Five months later the patient returned, the catheter withdrew 400 cc. residual urine and the cystoscope showed a small median bar. A Bottini operation was performed, two cuts being made. Six weeks later a catheter found 250 cc. R. U. and B. C. 740 cc. with poor tonicity. Letter one year after Bottini operation. "Urination is free and satisfactory. I void 12 times during the day and six times at night, and from one-quarter to three-quarters of a pint at a time. The result of the operation is entirely satisfactory."

The following two cases showed residual urine soon after discharge from hospital, and are therefore given here:

CASE VI (42).—Catheter life for three years. Bladder large, tonicity good, catheter used four times daily. Cystoscope showed a small round median lobe which was removed at operation and was 1 cm. in diameter. Small lateral lobes were also removed. The patient voided urine naturally but frequently and with difficulty after the operation, and examination three months later showed 500 cc. residual urine, and a small rounded median bar. A second operation was performed one year after the first and a tear was made into the rectum. A small median bar 1 x 1 x 2 cm. in diameter was removed. The rectal wound broke down and a recto-urethral fistula still persists, but the perineal fistula is closed and frequently no urine passes into the rectum and no feces into the urethra. Urine is voided without difficuty at intervals of six hours during the day and he does not have to urinate during the night. He is free from pain and he suffers so little discomfort that he has refused to have anything done to the recto-urethral fistula which is apparently steadily diminishing in size.

CASE VII (44).—Very frequent urination, over distended bladder, 1000 cc. residual urine, small median bar. At operation slightly enlarged lateral lobes and a small suburethral median lobe were removed. The patient convalesced well and was discharged on the 25th day, but urination was quite frequent and examination several months later showed 200 cc. residual urine, and with the cystoscope a small but definitely round median bar was seen.

May 19, 1906.—(21 months after operation.) The catheter withdraws 400 cc. R. U. and the cystoscope shows a small rounded median lobe. Urine is voided without much difficulty at intervals of two hours. He catheterizes himself at bed time and sleeps all night. He is so comfortable that he refuses further operation. This is the only patient who uses a catheter.

The following case in which the obstruction was not completely removed until a second operation had been performed one week after the first operation should be included here:

Case VIII (141).—Catheter life for two years. Small prostate with globular median lobe. Removal of small lateral lobes, and a pedunculated median lobe through the urethra. Examination with the finger showed no remaining obstruction, but an unusually strong or firm sphincter. It was thought unnecessary to do more than to dilate this. After removal of the tubes urination was difficult and painful and the catheter showed 500 cc. residual urine. One week after the first operation the wound was broken open, and the median portion of the prostate along with a piece of the vesical sphincter and the small capsule left by the median lobe was excised leaving a large opening at the vesical orifice. The edges of the wound were reunited, the tubes were withdrawn on the next day. The convalescence was rapid and in a few days the urine began to flow through the anterior urethra, the perineal fistula closed in 12 days (20 days after the first operation) and the patient was discharged on the 22d day after the first operation voiding urine freely at intervals of four hours and the catheter showed no residual urine.

Remark.—In Cases II and III the residual of 100 cc., which was present on discharge from the hospital, has since disappeared, one case being entirely well and the other case (II) suffering only from contracture of the bladder and diverticula. Cases VI and VIII are apparently identical in that the removal of small globular median lobe was not sufficient to provide free evacuation of urine, and it was necessary at secondary operations to excise the median portion of the prostate along with that part of the vesical sphincter. The splendid result obtained in Case VIII shows the advisability of doing the second operation without delay. In both of these cases the entire prostate was very small and of the inflammatory sclerotic variety (the kind which Albarran declares are unsuitable for prostatectomy by the perineal route), but the results obtained in these two cases show conclusively that if the median portion of the prostate beneath a pedunculated lobe is excised in these cases and a free opening provided, excellent results can be obtained.

In Cases I, IV, V, and VII, the bladder was markedly overdistended, and atonic before operation, and this probably had a good deal to do with the incomplete evacuation of urine, but in the last three cases the median portion of the prostate, which was shown by the cystoscope to be distinctly, although slightly, enlarged, was not removed,

and I feel certain that had this been done very thoroughly there would be no residual urine present. In ordinary cases (where the bladder is not atonic and greatly distended before operation) the small amount of obstruction which these cases present, would not, I believe, be sufficient to prevent complete evacuation of urine. I confess that an incomplete operation has been responsible for the imperfect results shown in the five cases mentioned above (Cases IV, V, VI, VII, and VIII). In all other cases the operation has been entirely satisfactory in that the obstruction has been completely removed and free urination established.

In the majority of cases the interval between urinations was four hours or more on discharge from the hospital. In a number of instances it was more frequent than normal owing to cystitis and contracture of the bladder. This was particularly true in cases where calculi had been present, where the bladder had been drained for a long time through a retained urethral catheter, or by suprapubic fistula. (These cases will be discussed later.)

Voluntary control of urination.—As remarked before, one of the most remarkable results of the operation is the rapidity in which voluntary control with interval urination is established, in many cases coming on immediately after removal of the drainage tubes. At first the sphincter is usually a little weak and a few drops of urine may escape when the patient suddenly changes his position, coughs, or sneezes, but in all but a small number of cases complete control was established before the patient left the hospital. In six cases there was for a short time a slight incontinence when the patient was on his feet. This occurred only occasionally, however, and there was no incontinence during the night. In only three cases has this slight occasional diurnal incontinence persisted. These cases will be referred to at length in discussing the ultimate results.

Suprapubic fistulæ were present in eight cases (96, 13, 16, 9, 69, 63, 131, 70), but in only two cases required a second operation to effect a closure. In both of these cases (16, 63) the fistula was surrounded by considerable scar tissue which was excised at the second operation.

Where suprapubic fistulæ are present I usually put only one catheter in the perineal wound and another in the suprapubic. The continuous irrigation being maintained through one and out the other. The

perineal tube is removed on the next day, but the suprapubic drainage is maintained until the perineal wound is completely healed, when the tube is removed and the fistula thoroughly curetted. Prompt closure has been thus effected in all but the two cases mentioned above. The great objection to suprapubic fistulæ is that the bladder is usually contracted, and often never regains its normal capacity.

G. THE CONDITION OF PATIENTS AFTER LEAVING THE HOSPITAL.

At intervals of six months (and sometimes less) I have sent circular letters to all perineal prostatectomy cases with a set of questions to be answered. In these the patient was asked whether the perineal fistula was closed, whether a catheter was used, how often urine was passed by day and by night, the amount voided at one time, as to the presence of pain, the return of erections, whether sexual intercourse was possible and in what way it differed from condition previous to operation, as to complications, treatment, general health, gain in weight, and finally whether they considered themselves cured.

I have been remarkably successful in keeping track of these cases, and up to November 30, 1905, failed to hear each time from but one case. This patient (35) who was operated upon March 22, 1904, replied on May 22, 1904, saying that the wound was closed, that he considered himself cured, and that his general health was fairly good. I have since written him, his physician, and his wife several letters but have not received any answer.

On May 5, 1906, the last circular letter was despatched, and replies have been received from all but six cases (but these had answered November 30, 1905).[8]

[8] *October 1, 1906.*—Just before the correction of the page proof circular letters were again sent to the 50 cases which had been operated during the year previous to June, 1906. Replies have been received from all but seven of these, and their answers have been attached to their histories reported in the appendix. All of the seven cases who failed to reply had been followed for several months after the operation, and I am confident that they are all in good condition. A review of the final answers of these 50 cases shows a continued improvement in their condition. In many of the recent cases in which the sexual powers had not returned the patients now report a return of erections. We still have to record only one death in the 50 cases operated during that year, and the functional results obtained fully bear out the statements made previously in other parts of this article.

Fifteen patients have died since leaving the hospital. The earliest case is that of No. (73) who died one month after the operation from "cerebral hemorrhage." The immediate result in this case was excellent and the operation apparently had nothing to do with his death. Two patients committed suicide four and six months after operation (cases 51, 55). Two patients (6, 9) died five months after the operation of intercurrent diseases. Both had been completely cured by the operation. One patient (case 107) died seven months after the operation in a runaway accident, and one (49) died four months after operation, of apoplexy.

One patient (case 5) died eight months after the operation of angina pectoris. He had been completely cured by the operation. Three patients (31, 24, 33) died one year after the operation, one of pneumonia, one of uremia, and one of causes which cannot be ascertained. The first patient had been completely cured by the operation, the second and third cases had suffered severely from severe cystitis, contracture of the bladder, and autopsy on one showed double pyonephrosis. Two cases died 23 months after the operation, one an accidental death while exploring in Africa, and the second of unknown cause. Both had been cured by the operation.

One patient (4) died 3 months after the operation of "catarrh of the stomach." He had had no urinary trouble since operation.

The only patient among these 15, who have died since leaving the hospital, in whom the obstruction to urination had not been completely removed was that of case 50, who died 20 months after the operation suddenly of unknown cause. I received a letter from him three months before his death in which he said that the result of the operation had been entirely satisfactory, but at an examination one year before I had found 300 cc. residual urine.

A review of these 15 cases shows that the operation was not responsible for the death in a single case. In four cases there had been evidence of impairment of the kidneys, one had definite nephritis and the autopsy in one case showed pyonephrosis. The other patients met accidental deaths (three) or died of intercurrent diseases in no way connected with the urinary tract. Six of these patients were in splendid condition before and after operation, and in the other cases the general condition was not nearly so bad as in many of the patients who are still living.

The number of months elapsed between operation and last report are as follows:

1	months	0	Cases.	19	months	2	Cases.
2	"	4	"	20	"	5	"
3	"	2	"	21	"	3	"
4	"	4	"	22	"	3	"
5	"	7	"	24	"	6	"
6	"	3	"	25	"	1	"
7	"	4	"	26	"	3	"
8	"	3	"	27	"	2	"
9	"	3	"	28	"	2	"
10	"	3	"	29	"	1	"
11	"	9	"	30	"	4	"
12	"	14	"	31	"	2	"
13	"	7	"	32	"	1	"
14	"	7	"	36	"	4	"
15	"	5	"	38	"	2	"
18	"	7	"	42	"	1	"

H. CONTRACTURE OF THE BLADDER BEFORE AND AFTER OPERATION.

In 50% of the cases the capacity of the bladder before operation was distinctly contracted, *i. e.*, less than 400 cc. In 52 cases (37%), the contracture was marked, and the capacity of the bladder between 50 and 300 cc. Seventeen of these cases were complicated with stone in the bladder, three had previously had calculus, two had calculi after the operation, and 30 were not associated with calculi.

The following table shows the capacity of the bladder and residual urine in these 30 cases in which no calculi were present:

	Retention Incomplete.		Retention Complete.
	R. U.	B. C.	B. C.
50 cc.	15 Cases.	0 Cases.	0 Cases.
100 "	5 "	1 "	0 "
150 "	2 "	2 "	0 "
200 "	2 "	7 "	0 "
250 "	5 "	11 "	2 "
300 "	0 "	7 "	0 "

Among 25 cases in which calculi were present the bladder capacity was between 50 and 250 cc. in 18 cases as follows:

50 cc.	2	Cases.
100 "	4	"
150 "	4	"
200 "	3	"
250 "	5	"

In eight cases in which the urine escaped through suprapubic fistulæ the bladder was contracted in every case.

A review of these cases shows that where calculi are present the bladder is apt to become contracted in the vast majority of cases, there being only three in our series in which it was as large as normal (500 cc.). In these cases the contracture is undoubtedly due to the frequency of urination produced by the presence of calculi.

In cases where suprapubic drainage has been provided contracture almost always results owing to the removal of all intravesical pressure. But in those cases in which neither of these conditions are present the explanation is not so easy. In some case severe cystitis, pericystitis, vesical ulcers, and diverticula are responsible for the condition, but in many instances none of these etiological factors have been present. In such cases I believe the contracture is due to a thickening of the muscular coats of the bladder brought about by efforts to force the urine through the narrowed orifice. This condition of contracture apparently persists as long as the retention of urine is not complete and the residual urine is not very large, as a review of my cases shows no case with contracture of the bladder and complete retention of urine except those in which calculi were present or the bladder had become contracted from long drainage through a suprapubic or a urethral catheter. Contracture of the bladder appears therefore to be the first change which occurs in the viscus as a result of prostatic obstruction. Later, residual urine begins to appear and gradually increases in amount until it approaches that of the vesical capacity. When the residual urine becomes very large the bladder apparently begins to dilate in a certain number of the cases, and as remarked above, is almost always large in uncomplicated cases when the retention of urine is complete. The formation of trabeculæ, pouches, and diverticula occur simultaneously with the thickening of the muscular coats and the increase in intravesical tension, and in a few cases diverticula may form an important complication, as shown in cases (30, 143, 82, 37).

A study of the cases in which frequency of urination has been present after the operation shows that it is almost always due to previous contracture of the bladder.

In 30 cases urination was more frequent than usual at the time of discharge from the hospital, varying from one to three hours, and in one case being every half hour, and all of these cases were character-

ized by contracture of the bladder before operation and in 16 calculi had been present. The treatment adopted in these cases was simply to have the patient drink water in great abundance and retain urine as long as possible in the bladder to dilate the bladder by hydraulic pressure, given with or without a catheter. The results have been remarkably good and in many instances where the bladder was considerably contracted before and immediately after operation, the capacity has gradually increased until now the patient voids as much as 500 cc. at one time.

A careful study of the ultimate results of these 145 cases shows only 23 in which urination may be said to be too frequent, and in all but four of these cases more or less marked contracture of the bladder was present before operation. One case with a bladder capacity of 500 cc. before operation and complete retention of urine voids, now five months after the operation, at intervals of three hours, and 300 cc. in amount (125). The other three cases were those in which the obstruction was not completely removed (44, 50, 51) and will be given in full later on.

Reports from the remaining 19 cases show that the amount of urine voided at a time is about 60 cc. in two cases, "small" in four cases, 125 cc. in one case, 150 cc. in two cases, 200 cc. in one case, 250 cc. in two cases, 300 cc. in four cases, 500 cc. in one case, "abundant" one case.

The interval between urination is two hours in four cases, two and a half hours in one case, three hours in eight cases, one hour during the day and four hours at night one case, two and a half hours during the day and five hours at night in two cases.

In the three cases mentioned above in which the obstruction was not removed the interval was one hour in two cases and "very frequent" in one.

A review of these cases shows conclusively that the most common cause of frequency of urination after prostatectomy, when the obstruction has been completely removed, is contracture of the bladder. In cases where polyuria is not present and the patient voids about 1500 cc. of urine a day, a bladder capacity of 300 cc. causes no inconvenience, and the patient does not have to void more than five or six times a day. But in most of these old men polyuria is present in marked degree, and when the bladder is at all contracted urination is necessarily more frequent than normal. A peculiar feature in re-

gard to these polyurias is that more urine is secreted at night, when the patient is supine, than during the day, and this accounts for the frequency with which some of these patients have to arise at night to urinate. In one of my cases 60 to 80 ounces of urine was secreted during the night and only 10 ounces during the day. In such a case nocturnal frequency of urination is necessary although the bladder may be fairly large.

In conclusion I may say that in only those cases characterized by contracture of the bladder is the patient disturbed at all by frequency of urination (barring the three cases of incomplete prostatectomy mentioned above).

I. ULTIMATE RESULTS.

Mortality.

There have been seven deaths following the operation.

In none of the cases was the death directly in consequence of the operation, as shown by the fact that one occurred during the fifth week, two during the fourth week, three during the third week, and one during the second week after the operation.

The cause of death was as follows: Pulmonary thrombosis, one case; hypostatic congestion of the lungs, two cases; double pneumonia, one case; pyonephrosis and uremia, two cases; secondary hemorrhage from a vesical ulcer on eighth day after operation, one case.

All but one of the patients were in weak condition before the operation, and two were over 80 years of age, one being 87 years. Two were markedly uremic, going down rapidly, and were operated on as a last resort. The seven cases were briefly as follows:

CASE I (21).—Age 73, admitted November 20, 1903. Examination shows a diastolic murmur and a blurring of the heart sounds in the aortic area. The prostate is only slightly hypertrophied and the cystoscope shows a small median lobe.

Operation, November 20.—Removal of median and lateral lobes. The patient reacted well, pulse 88 at the end, temperature 99 on the following night. In a few days the patient was out of bed and walking about the ward.

13th day.—Patient in excellent condition, voiding urine through urethra, almost ready to leave hospital.

December 3, 1903.—The patient has become constipated and a soap-suds enema is ordered. The enema caused considerable tenesmus and immediately afterward the patient vomited and suddenly collapsed, dying within five minutes.

Autopsy.—There is a firm organized clot with fresh clot built on it

extending from the left auricle down the inferior vena cava. Condition of bladder and wound excellent.

Case II (23).—Age 81, admitted November 14, 1903. Considerable general arteriosclerosis and intermittent pulse. Bladder greatly distended reaching two inches above umbilicus. Catheter removes 2000 cc. residual urine without emptying the bladder. After four days, catheterization became impossible and suprapubic aspiration was performed for five days.

Operation, November 24, 1903.—Removal of lateral lobes, a small median bar which was present did not seem sufficiently large to warrant removal. The patient reacted well, but when the tubes were removed the bladder became distended and they had to be reinserted. Three weeks after the operation the patient became weak, hypostatic congestion of the lungs developed and on December 24 he died (31st day).

Case III (52).—Age 65, admitted September 20, 1904. Patient in bad condition, frequent nausea and vomiting, symptoms of uremia of long duration. Catheterization impossible, aspiration performed. Later successful catheterization. Constant drainage of bladder with catheter for 10 days. At the end of this time the urethra was irritable, catheter caused pain, the patient was still uremic and nauseated. Operation to supply better drainage decided upon.

September 30.—Removal of three moderately enlarged lobes. Following operation the uremia, nausea, and vomiting continued. The patient took no food and on October 13 enterostomy was performed to supply nourishment. The patient died on the 14th day. Autopsy showed double hydropyonephrosis.

Case IV (65).—Age 87, admitted December 3, 1904. Arteries moderately sclerotic and heart enlarged. Prostate very large.

Operation, December 7.—Enucleation of very large lateral and median lobes. The patient reacted well, and on December 27 was in excellent condition voiding through the anterior urethra and walking about the ward. On the next day, three weeks after the operation, his temperature began to rise and was associated with severe bronchitis which rapidly changed into pneumonia, and the patient died January 1, 24th day.

Case V (83).—Age 73, admitted April 17, 1905. Suprapubic prostatectomy had been performed four years before by another surgeon and patient was in desperate condition after the operation. The lungs are hyperresonant, the heart enlarged and several murmurs are present. The prostate is considerably enlarged and the cystoscope shows two calculi.

Operation, April 24.—Removal of lateral lobes; median portion slight and not removed. The patient reacted well, but on May 1 had a chill followed by fever, drowsiness and hiccoughing which persisted until his death, May 14. Death from hypostatic congestion of the lungs on the 21st day. No autopsy.

Case VI (89).—Age 53, admitted August 1, 1904. Severe stricture of urethra and cystitis following gonorrhœa 18 years ago. Dilatation of stricture afforded no relief, the bladder was contracted, there were 100 cc.

residual urine present. The cystoscope showed a large vesical ulcer involving the entire trigone and a slight median bar. The prostate was indurated but very little enlarged. The patient was pale, weak, despondent. Prostatic massage and urethral dilatations was used intermittently for nine months without benefit and finally it was decided to perform urethrotomy for the stricture and at the same time to perform partial prostatectomy and curette the vesical ulcer. Four days after the operation there was considerable bleeding, seemingly from the bladder, which was apparently controlled, but several days later there was more hemorrhage and pain in the bladder followed by the passage of clots and on May 10 a suprapubic operation was performed and a large clot evacuated from the bladder which was then packed with gauze. The patient did not improve, however, and died the next day. Autopsy not allowed.

Case VII (109).—Age 73, admitted July 20, 1905. A very weak sick old man. The prostate is markedly enlarged. The patient was treated by frequent catheterization for four days, but his condition grew steadily worse, fever. nausea, and vomiting were present and he was drowsy and irrational. Catheter drainage did not seem sufficient and it was thought best to supply perineal drainage after removal of the prostate. The patient stood the operation well, and for a few days seemed to improve, but he soon showed evidence of uremia again and finally died on August 17 (the 27th day after the operation) of uremia. Autopsy was not allowed.

Although in several of the seven fatal cases reported above death was in no way caused by the operation, it is necessary to include all of them in figuring the mortality.*

**Final Note as to Mortality, January 7, 1907.*—Just before going to press I take the opportunity of bringing my statistics up to date, thus covering the period of six months since the manuscript was finished and sent to the printer. The many apparent unavoidable delays in the publication of this volume thus gives me an opportunity of adding many other cases. I am glad to report that there have been no other deaths or imperfect results; that all the patients have left the hospital well, and that as a whole the convalescence has become steadily better.

I have now had 185 consecutive cases of perineal prostatectomy with seven deaths as above recorded, a mortality of 3.7%. This includes all of the early cases, when the operation was in a developmental stage and much less satisfactory—the patient being confined to bed and the drainage not removed for much longer periods. It certainly does not represent the true mortality. During the past two and one-half years there have been 100 cases with only two deaths, a mortality of 2%. But the most convincing evidence of the benignity of the operation of conservative perineal prostatectomy is the fact that in the last 60 consecutive cases there has not been a single death or bad result.

The Removal of Obstruction.

There are only four cases presenting evidence that the obstruction to free urination has not been completely removed. In three of these cases definite evidence of obstruction with residual urine manifested itself, but in only one case did complete retention of urine supervene. In the fourth case the patient voids freely at normal intervals and does not arise at night, and was greatly surprised when 150 cc. residual urine was obtained. This case (126) was one in which the bladder was greatly distended and atonic, with a residual urine of 940 cc., and as only five months have elapsed since the operation it is possible that this residuum may eventually disappear. The three cases in which definite obstruction has shown itself are as follows:

Case I (50).—Age 71, admitted September 7, 1904. Difficulty of urination has been present for 30 years, and for 25 years has had to arise 10 or 12 times at night to urinate. The bladder is greatly distended, the catheter withdraws 1100 cc. residual urine and the vesical tonicity is poor. The prostate is moderately hypertrophied and the cystoscope shows a slight median bar. After three weeks catheterization, the amount of residual urine was still 900 cc.

Operation, September 27.—Removal of the lateral lobes, median thought to be too small to warrant removal. The patient reacted well and was discharged on the 37th day, but the catheter showed 200 cc. residual urine. Three months later it had increased to 400 cc. and the cystoscope showed a small median bar. A Bottini operation was performed and six weeks later only 200 cc. residual urine was found.

February 5, 1906.—Letter. "Although I void urine about a dozen times during the day and six times at night, urination is free, the amount voided is sometimes three-fourths of a pint at a time and the result of the operation is entirely satisfactory."

Case II (44).—Age 65, admitted August 5, 1904. Difficulty of urination for three years. On admission urination every 15 minutes during the day and eight times at night. The bladder is greatly distended and 1000 cc. residual urine are withdrawn. The cystoscope shows a slight enlargement of the median and lateral lobes. On rectal examination the prostate is only slightly enlarged. Catheterization three times daily for two weeks.

Operation, August 18, 1904.—Enucleation of two small lateral lobes each in one piece and a small rounded median lobe. Patient convalesced well and was discharged on the 25th day. Seven months after the operation the catheter found 200 cc. residual urine. The cystoscope showed a slight rounded median bar. With finger in rectum and cystoscope in urethra the median portion of the prostate was no thicker than normal.

May 19, 1906.—The patient voided 100 cc. and the catheter withdrew 500

cc. The cystoscope shows a small rounded median lobe. The patient uses a catheter at bed-time and in the morning, but during the day voids urine naturally at intervals of two hours, and is entirely comfortable. He refuses further operation.

Case III (51).—Age 67, admitted August 1, 1904. Difficulty of urination for two years, considerable pain, voiding at intervals of 15 minutes. The prostate is small and hard. The cystoscope shows a small median lobe, the residual urine is only 20 cc. and the bladder irritable and contracted holding only 140 cc.

Operation.—Excision of two small lateral lobes and a small globular suburethral median lobe. The convalescence was very satisfactory, and two months later a catheter showed no residual urine and a bladder capacity of 300 cc. The urine was voided freely at intervals of an hour and the condition of the patient was good.

May, 1906.—The patient's family report that some time after discharge the patient began to suffer pain, urination became difficult and very frequent and finally catheterization was necessary for four days when the patient committed suicide.

In reviewing these three cases it is evident that the obstruction was not completely removed from the median portion of the prostate. It is interesting to note that the prostate was of the small sclerotic variety, and as remarked in an earlier chapter of this paper it is evident that in these cases there is generally a fibrous ring at the vesical neck which requires more than removal of a pedunculated median lobe to relieve the obstruction completely. These three cases occurred during August and September, 1904. It is now my practice in cases where the prostate is of the small fibrous variety to insert the index finger through the urethra into the bladder after the removal of the prostatic lobes, and, if I find at the vesical orifice a very tight sphincter or a mass of tissue remaining in the median portion after removal of the intravesical middle lobe, I expose the median portion of the prostate by dividing the lateral wall of the prostatic urethra, and then excise the median portion of the prostate along with the mucous membrane covering it. In the several cases in which this has been done the results have been perfect, and it is remarkable to note that voluntary urination with perfect control was established within a few days after the operation. An examination of the tissue removed showed that the ejaculatory ducts had not been disturbed. In fact it is an easy matter to attack this median portion even when not enlarged and not injure the ducts, which are quite remote in this region.

Perineal Urinary Fistulæ.

See Chapter on Convalescence, p. 93.

Frequency of Urination Due to Contracture of the Bladder

is present in five cases. In two of these cases (32, 70) calculi were present before operation. In both of these cases the interval between urination is about two hours, but the stream is large, the patient suffers no pain, and but for the frequency of urination the result is entirely satisfactory. In three cases (10, 14, 105) no calculi were present, but the bladder was markedly contracted, the capacity being about 160 cc. These cases have been free from residual urine since the operation, and urination is free, painless, and the stream is large, but the interval between urination is about two hours and is apparently entirely due to the small size of the bladder.

Cases Now Suggesting the Presence of Calculi.

In five cases the reports received suggest the presence of calculi. In all of these cases pain was a prominent symptom before operation and in three cases calculi were present and removed (85, 33, 45). In these cases examination with a searcher after operation failed to reveal the presence of calculus, but the bladder was contracted and considerable cystitis was present. In two cases (46, 54) the symptoms strongly suggested vesical calculi, but owing to hemorrhage cystoscopic examination was unsatisfactory. A careful search failed to reveal any calculi, and at operation none were removed, but no notes have been made as to whether a very careful search was made. One of these patients (54) considers himself entirely cured although he suffers from "a scalding pain when the bladder is nearly empty." The other case, however, complains of frequent and painful urination, and other symptoms of vesical calculus are present.

A review of these five cases in which pain is present suggests that stones have formed since the operation in three cases, and that in one case at least calculi were present before operation and were not removed (46). It is only necessary to examine a few autopsy specimens to see how easy it would be to fail to detect calculi with a searcher before operation and in some cases to find them at operation in these cases. The frequent presence of pouches, diverticula, and pockets behind enlarged lobes is one of the strongest arguments for the neces-

sity of cystoscopy before operation. I feel sure that in many of the cases in which calculi were present, had I not been aware of the fact from previous cystoscopic examinations, they would not have been found. Often it was only after repeated endeavors and careful searching with forceps and scoops that the calculi were finally removed. It is remarkable how seldom, however, calculi encysted in diverticula have been found, there being only one case in which this condition was present. In this case a suprapubic prostatectomy was performed after the calculi had been removed from the diverticulum. In such cases the suprapubic route is distinctly preferable, though it should be possible to remove small calculi from diverticula with large orifices through the perineum, if the location of the diverticula is definitely determined by the cystoscope beforehand.

Two Cases Report a Peculiar Marked Nocturnal Frequency of Urination.

One of these cases (8) was characterized by a small inflammatory prostate, severe cystitis, and vesical irritability. The patient considers himself greatly improved by the operation, but urination is particularly frequent at night. In the second case (25) the patient is now 80 years of age. The prostate was very large, and the bladder contracted and a severe cystitis present. Urination is free, the patient can empty bladder and retains urine for three hours during the day, but during the night he frequently voids from 10 to 20 times. In some cases nocturnal frequency is explainable by a markedly increased production of urine during the night, but in these two cases no such explanation seems applicable.

An interesting case is (106), in which, although there is no residual urine present and the bladder capacity is 360 cc. the patient voids at intervals of two hours, night and day, and not more than 180 cc. at a time. Urination is free and there is no explanation for this frequency unless it be cystitis.

Recto-Urethral Fistulæ

are present in two cases. Both are minute and give very little discomfort. In both cases urination is normal at normal intervals, and the patients suffer no inconvenience (cases 26 and 42).

Incontinence of Urine.

Although incontinence of urine was present before operation in six cases it has persisted since operation in only one case, the history of which is briefly as follows:

(119).—Age 55, admitted November 4, 1905. Gonorrhœa 36 years ago, no note as regards syphilis. Two years ago he began to have severe intermittent pains in his legs. About the same time he began to have a decrease in his sexual powers, a feeling of discomfort in the region of the bladder and incontinence of urine. He was catheterized and a large amount of residuum was withdrawn, since then he has occasionally had complete retention of urine. The incontinence and pains have persisted, but the catheter is necessary three times daily. On admission the retention of urine was complete and the bladder very large. The prostate was only slightly enlarged, the cystoscope showing a small median bar. Examination showed a decrease in the deep reflexes, but the only symptoms of tabes were loss of sexual power and the history of lightning pains. (See complete history.)

At operation slightly enlarged lateral lobes and a small middle lobe were removed. The convalescence was satisfactory, the fistula closing on the 14th day and the patient leaving the hospital on the 18th day. He was able to retain urine for six hours at night, but during the day there was incontinence which has persisted up to the present time. Five months after the operation he began to have peculiar painful seizures in the abdomen, a girdle sensation with an extremely sensitive area eight inches wide around the body, corresponding to the lower dorsal and sacral segments. His physician writes that he is convinced that he has spinal disease. The patient reports (May, 1906), that he voids urine naturally at intervals of three or four hours, during the day and only once at night, that there has never been any nocturnal incontinence and that his ability to retain urine during the day is improving.

Three patients, all very old men (78, 80, and 85 years of age) report that occasionally, when the bladder is allowed to become very full, and the desire to urinate is imperative, and unless a urinal is near, a few drops of urine may escape. In two of these cases (93, 128) this happens but seldom, causes no inconvenience, and cannot be considered incontinence. In third case (16) there is apparently a slight weakness of the sphincter. In this case the prostate was huge and in its removal through the perineum it was necessary to excise a good deal of the mucous membrane covering the median portion of the prostate, and the vesical neck was left greatly dilated. Perhaps this has something to do with the sphincteric weakness.

In reviewing these cases it seems highly probable that spinal disease

is responsible for the only definite case of incontinence which I have had as a result of perineal prostatectomy by this method. These statistics absolutely disprove the statements of Freyer and others that incontinence frequently results from perineal prostatectomy. In the technique which I employ both external and internal sphincters are usually left intact, and incontinence should never occur, and does not as my cases show. In cases where the prostatic lobes are removed through a median perineal incision involving the external sphincter of the urethra, and where the prostate has been excised after hemisection of the posterior surface, as employed by Albarran, a good portion of the urethra being sacrificed, it is easy to understand how incontinence may occur.

Pain.

Although pain was a very prominent symptom in 50% of the cases (occurring in 76 cases before operation, in 61 cases being considerable, and often excruciating) there are only four cases in which the pain has been considerable since operation. One of these cases (51) had a recurrence of prostatic obstruction and has been mentioned above. Two of the cases (45, 33) had calculi and it seems probable that they are again present. The fourth case (46) is one in which calculi were suspected but could not be found, and the painful symptoms have persisted.

In three cases (85, 54, 4) urination is entirely satisfactory with the exception of a slight pain which comes on at the end of urination. In one of these cases a calculus was removed at operation; in the second it was suspected but was not found, and in the third several were passed after operation. In the remaining cases the patients are entirely free from pain, with the exception of a few instances in which a burning sensation or slight pain is present in the urethra during urination. All of these patients, but one, have cystitis. It is indeed remarkable that so few patients complain of any pain although cystitis in more or less severe degree is present in the great majority of cases. Two good examples of the complete disappearance of very severe pain are cases 96 and 102.

The Preservation of Sexual Powers.

In an earlier part of this paper condition of patients as regards sexual powers were given in tabulation. As stated there the sexual

powers in those under 50 years of age were normal in 100% of the cases.

Between 50 and 60 years of age erections were normal in 78% of the cases noted, and present but impaired in 11%, and coitus was normal in 74% of the cases noted, and present but impaired in 21%.

Between the ages of 60 and 69 erections were normal in 55% of the cases, and impaired in 25%. Coitus was normal in 38% and present but impaired in 32%.

Between the ages of 70 and 79 erections were present in 32% of those noted, and impaired in 14%. Coitus was normal in 21%.

I have made careful inquiries to obtain if possible the present condition of all cases upon which I have operated, and the following tabulation will show the condition of the patients before operation and their present status.

I. *Erections present and coitus normal before operation, 41 cases*

Status præsens:

Erections returned, 28 cases:

Coitus satisfactory, 17 cases.

Coitus impaired, 5 cases.

No coitus attempted, 6 cases.

Ages of these patients:

		37	years	1	Cases.
40	to	49	"	1	"
50	"	59	"	14	"
60	"	69	"	11	"
70	"	79	"	1	"

Erections not returned, 8 cases:

Ages:

		58	years	2	Cases.
60	to	69	"	5	"
		70	"	1	"

Recent cases operated within the last month, 4.

Not heard from, 1 case.

II. *Erections present but coitus impaired before operation, 1 case.*

Status præsens:

Erections returned, coitus still impaired, 1 case.

III. *Erections present, coitus not performed before operation, 16 cases.*

Status præsens:

Erections returned, 12 cases.

Erections not returned, 4 cases.

Ages of the 12 patients in which erections have returned.

		56 years	.....	1	Cases.
60	to	69	"	5	"
70	"	79	"	6	"

IV. *Erections and coitus impaired before operation, 18 cases.*

Erections returned, coitus now satisfactory, 8 cases.

Erections returned, coitus still impaired, 5 cases.

Erections not returned, 5 cases.

V. *Erections impaired, coitus not possible or not attempted before operation, 7 cases.*

Erections returned, 4 cases.

Erections not returned, 3 cases.

VI. *Erections absent before operation and coitus impossible for a considerable period, 42 cases.*

Of these erections have returned in 5 cases.

Coitus satisfactory, 3 cases.

Coitus not attempted, 2 cases.

Erections not returned, 37 cases.

VII. *No note as to erections and coitus before operation, 19 cases.*

In these cases erections have returned in no case.

J. THE PATHOLOGY OF PROSTATE HYPERTROPHY AS SHOWN BY A STUDY OF 120 CASES.

(By John T. Geraghty, in collaboration.)

The opinions of various authors regarding the nature of prostatic hypertrophy are varied, and numerous pathological varieties have been enumerated.

Albarran and Hallè, as the result of their study of 100 cases, recognized three varieties of benign hypertrophy, (1) a glandular form, (2) a fibrous, and (3) a mixed form. The fibrous form is rather rare, there being only three cases in the series examined, while Motz in 30 cases found only one.

Virchow thought that the hypertrophy was due to the formation of lobular tumors which he described as hyperplastic myomata, but also admitted the existence of a rare form of hypertrophy produced solely by the development of the glandular tissue. Motz has seen a case of this rare form described by Virchow and applies to it the term diffuse polyadenoma. We have not encountered a like form of hypertrophy in our series.

According to Rindfleisch and many others, two forms exist, a so-called soft form, glandular in character, and a hard form, the fibro-muscular. Rindfleisch considered that the usual prostatic hypertrophy was a fibro-muscular increase of the peritubular stroma with at the same time lengthening and marked folding of the tubules themselves The first changes take place in the subepithelial tissue, and the peritublar stroma of the individual gland segments. If now in the further development there is a rapid growth of the stroma elements the glands are destroyed and the fibro-myomatous form of hypertrophy is the result. If, however, there is a rapid increase in the gland elements at the same time that the interstitial tissues hypertrophy, the glands are preserved and the so-called soft form is produced. Rindfleisch thought that the primary change was in the stroma. Alexander, Gouley, Caminiti, and others think there exist two periods in prostatic hypertrophy; during the first the glands develop excessively and in the second an excessive development of the stroma occurs. Jores insists that prostatic hypertrophy is not of the nature of a neoplasm while Albarran and Mansell Moulin consider it an adenoma.

Motz holds that the hypertrophy is a hyperplasia of all the elements of the prostate as a result of repeated congestions (which of course would make sexual affairs a strong etiological factor).

Velpeau was struck by the microscopic appearance of the spheroidal tumors which one sees in the hypertrophied prostate. He at first considered these spheroids to be of a fibrous nature, but later admitted that glandular elements may take part in their formation.

Ciechanowski insists that the hypertrophy is the direct result or it might be termed the end result of chronic prostatitis. As a result of the prostatitis the excretory ducts become narrowed or occluded with a consequent dilatation of tributary acini. With the gradual increase in the fibrous tissue resulting from the prostatitis the dilated acini are divided by constricting fibrous bands and thus is produced

new culs-de-sac. Nowhere, he says, does he find any evidence of glandular proliferation.

Motz in a recent splendid contribution has called attention to the fact that hypertrophy practically always begins in the glands close to the urethra. Thus we see that numerous opinions regarding the nature of prostatic hypertrophy are held and numerous theories have been proposed to explain the pathological processes in this common senile affection.

Although many differences exist regarding the varieties of prostatic hypertrophy nearly all authors of recent years are agreed that the glandular form is the most frequent.

Taking as a basis of classification the composition of the hypertrophy we have been able to distinguish three types of cases: (1) Glandular, (2) fibro-muscular, and (3) inflammatory.

The first two forms alone represent true hypertrophies. The inflammatory form is not a true hypertrophy but we include it because it represents a form of obstructing prostate about which we will say more later.

Although here and there one encounters a picture typical of the glandular and the fibro-muscular varieties, various transitions exist and a clear-cut boundary line cannot always be easily drawn between them. This classification which we have employed is not to be understood as representing distinct anatomical varieties, but rather types of cases which are but different phrases of evolution of the same pathological process. Hypertrophy is to be considered a hyperplasia of all the elements of the prostate the various elements undergoing augmentation in different prostates and often in the same prostate in varying degree. We have every transition from prostates in which the glandular tissue entirely dominates the field to those in which there is very little glandular element present and the tissue is almost entirely stroma. This stroma in one instance may be largely connective tissue, in another the muscular element may be considerable, while again we find areas in which muscle exists in almost pure form.

Various combinations may be present in the same prostate so that it is not always possible to draw a sharp line of demarcation.

The various forms which we have distinguished in our study of 120 cases occurred in the following frequency:

Glandular	100
Fibro-muscular	14
Inflammatory or fibrous	6

Gross appearance of glandular form.—When enucleated the surface is usually lobulated and the consistency is generally soft and elastic. On cutting into such a prostate the tissues may be more or less sponge-like due to dilated glandular acini while here and there are seen the gaping orifices of small retention cysts which have been cut across. An abundance of secretion oozes forth. Usually the cut surface pre-

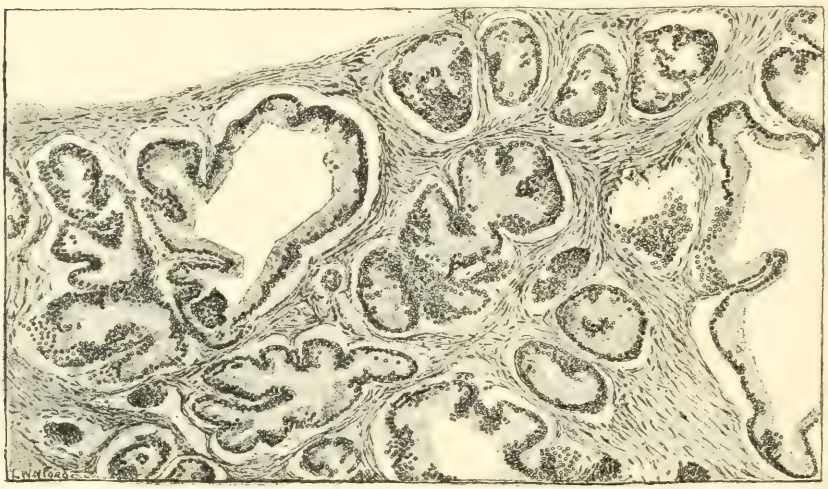


Fig. A.—This represents a picture commonly seen in the glandular form of hypertrophy. The acini are for the most part dilated and several have undergone cystic dilatation. Epithelial proliferation is active.

sents the picture of numerous spheroidal tumors, differing in size, separated from each other by encircling and interlacing bands of tissue of a denser character and of varying thickness. These spheroidal lobules project beyond the surface and are sometimes distinctly encapsulated and can be quite readily enucleated. At times the tendency to formation of these lobules is only indistinct and the picture presented resembles somewhat that of a diffuse glandular hypertrophy. The interspheroidal tissue is as a rule largely composed of a fibromuscular stroma although sometimes it contains a fair number of acini. In less glandular prostates the spheroids are less numerous with an increased amount of interlobular stroma which contains sparsely disseminated acini or the spheroidal bodies may be numerous but comparatively poor in gland acini. In such prostates the tissue is

denser and more compact although here and there may be spongy-looking areas due to dilated culs-de-sac.

On microscopic examination the gland tissue for the most part occurs in lobules and when these are not present the acini seem to have a tendency to segregate in well-defined areas. The acini are usually dilated, often elongated or ovoid, and with rather complex lumina



FIG. B.—The epithelial activity in one of the acini shown, has resulted in the formation of capillary loops. Note the very high character of the epithelium.

due to infolding and often papillomatous-like proliferation of the lining wall (see Fig. A).

The epithelium lining the acini presents a variety of pictures. One acinus may be lined by a double layer of cells, the internal being a high cylindrical type with the nucleus near the basal end and an in-

ternal layer of rather cuboidal-shaped cells. Again there may be but a single layer of high cylindrical cells. In the culs-de-sac where proliferation is active there may be beneath the layer of cylindrical cells numerous layers of rather polygonal-shaped cells. Very often

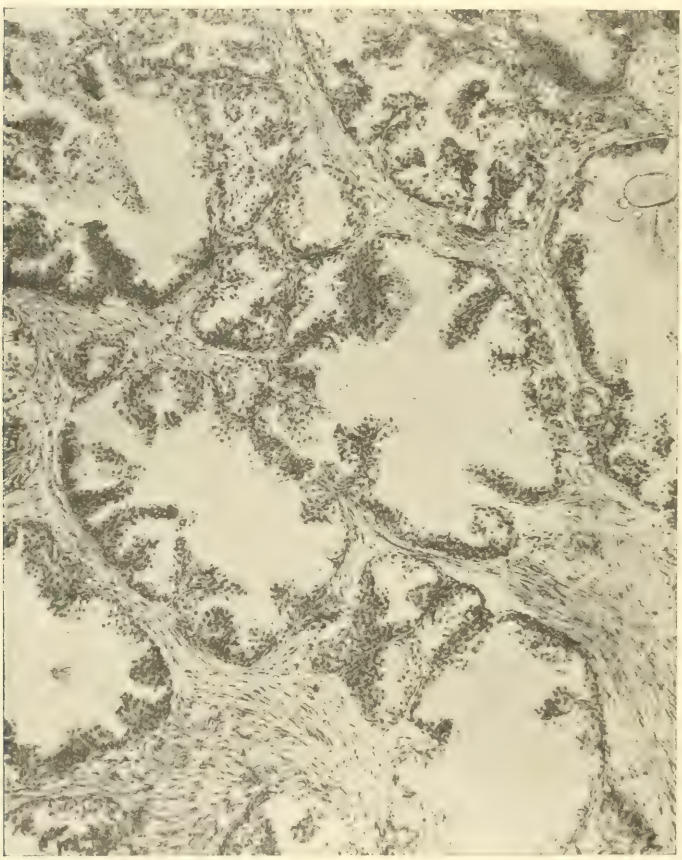


FIG. C.—A very glandular form of hypertrophy. The acini are dilated and show a rather unusual amount of intraacinous proliferation.

in the same acinus at one point a single layer of cylindrical cells may be seen and at other points there may be accumulated heaps of small epithelial cells.

Occasionally capillary loopings of epithelium are noted as seen in

Fig. B. The internal layer of cells lining the acini in the hypertrophied prostate is much higher than the epithelium lining a normal acinus. In areas where the glandular proliferation is active the walls of the acini are serrated and well-marked papillomatous projection



Fig. D.—A higher magnification of portion of the field shown in C. The papillary projections in some instances have slender pedicles of stroma, while at other times they consist only of knuckles of epithelium.

into the lumina of the dilated acini may be present (see Figs. C and D). More or less numerous culs-de-sac which have undergone cystic degeneration are encountered. Sometimes there may be but a few in

a given area and again cystic degeneration of nearly all the acini within one or more lobules may be present (see Fig. E). These acini are usually lined by a single layer of rather flattened epithelium and rarely give evidence of a proliferative activity. About the periphery of the spheroidal lobules the tissue is as a rule condensed and contains

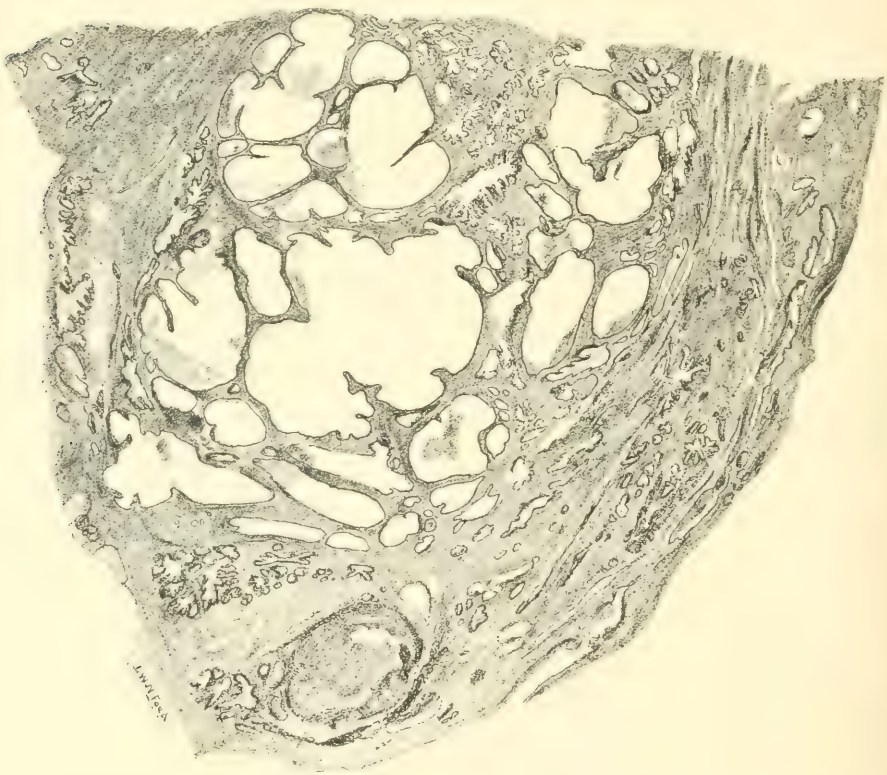


FIG. E.—In the center is seen a rather extensive degree of cystic dilatation of numerous acini.

acini in varying numbers most of which are compressed and elongated (see Figs. E and F).

Fibro-muscular.—The fibro-muscular forms seldom reach the large size attained by the glandular. The largest in our series weighs 25-G., while all the very large prostates are of the glandular type. The consistency is much firmer than the glandular although it never

has the induration which one encounters in the carcinomatous prostate. On section it is less succulent and distinctly more homogeneous in appearance although isolated spheroids are noted which may be mostly if not entirely composed of a fibrous or fibro-muscular tissue.

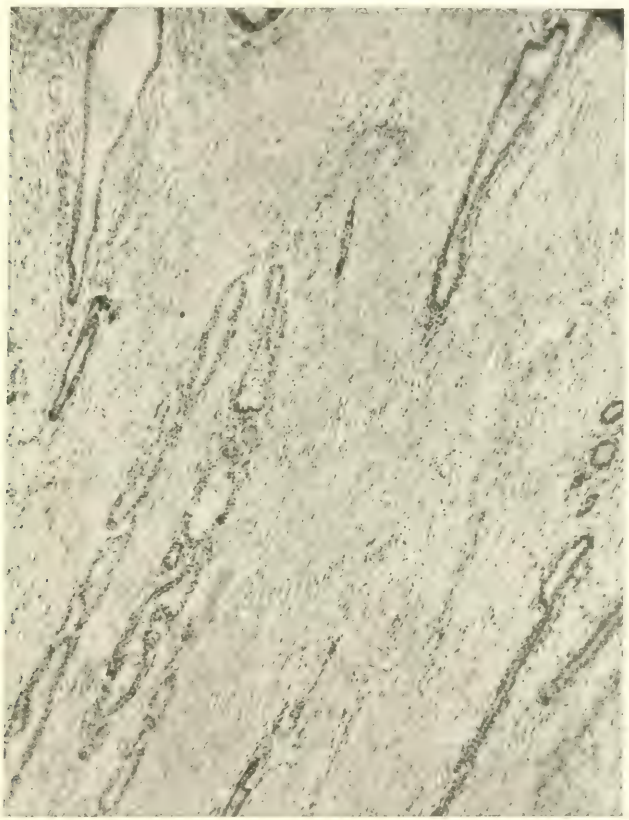


FIG. F.—A section from the periphery of a hypertrophied lobule showing the condensation of the tissue and the flattened and elongated acini.

The surface is as a rule moderately lobulated. The dilated orifices of gland acini are sometimes seen and occasionally small retention cysts are noted. The gross picture presented is usually quite different from that which is seen in the glandular forms.

On microscopic examination the acini are rather regular in outline,

separated by broad bands of stroma and seldom show much signs of active gland proliferation (see Fig. G). They are sometimes dilated but seldom display a degree of cystic degeneration which one finds in more adenomatous hypertrophies. The stroma varies a great deal from one which is mostly connective tissue to types where the muscular

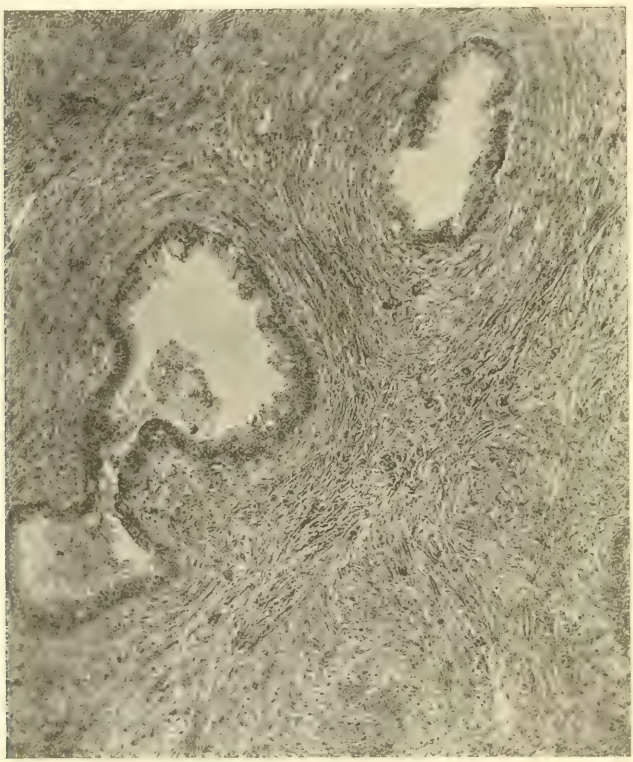


FIG. G.—Represents a fibro-muscular form of hypertrophy. The stroma is much in excess of the glandular elements compared with C.

element predominates and the stroma is of course much in excess of the gland element. Both the adenomatous and fibro-muscular forms contain spheroids in varying number.

Fibrous.—Under the fibrous or inflammatory form of hypertrophy we have included a very interesting group of cases with marked prostatic symptoms and partial or complete retention of urine. The pros-

tates in this group are not enlarged or at most very slightly so (cases 87, 89, 101, 133, 137, 143).

On gross examination they contain no spheroids, but the cut surface is rather homogeneous and apparently fibrous. These are not true hypertrophies, but represent a type of prostatitis. The prostatic obstruction is consecutive to inflammatory processes which produce a fibrous hyperplasia about the vesical orifice or result in the formation of an inflammatory median bar. The microscopic examination of the median bar in these cases has always demonstrated its inflammatory nature while the lateral lobes present no changes other than those noted in chronic prostatitis.

Chronic prostatitis has been found very frequently in our series of cases, but of course a large percentage of the patients were leading a catheter life or suffering from chronic cystitis. Naturally then one would expect prostatitis to be a frequent complication. A well-marked prostatitis was present in 58%—a slight prostatitis in 31%, viz., a few limited areas of mild prostatitis—no prostatitis was found in 11%.

We have before referred to the views of Ciechanowski regarding the rôle which prostatitis plays in the production of prostatic hypertrophy. A review of Ciechanowski's cases shows that he was dealing almost entirely with small prostates found at post-mortem while ours are only cases requiring operation.

If Ciechanowski's views as to the etiology (obstruction of the excretory ducts) are correct, one would naturally expect to find the acini lined by a flattened and not by a tall cylindrical epithelium as we have found. As the process of glandular proliferation proceeds, some acini and sometimes groups of acini probably become separated from the excretory ducts and as a consequence these culs-de-sac undergo cystic dilatation. In such acini the lining epithelium most frequently consists of but a single layer of flattened epithelium. Such a character of epithelium one would expect in all the acini if Ciechanowski's views as regards the formation of new acini were the correct ones.

Again it is inconceivable that hypertrophy of large size and rich in gland tissue could be produced by any process similar to the one he describes.

Chronic prostatitis with the production of a large amount of fibrous tissue is generally accompanied by atrophy of the gland elements rather than an increase in their volume. In our examinations the

areas of prostatic tissue where the chronic inflammatory tissue formation was most marked the acini were diminished in number, often compressed and atrophic, and again nothing but vestiges of former acini remaining. Furthermore, in 11% of the prostates examined no evidence of an inflammatory process were found. Again in the vast majority of cases where prostatitis was present the prostatitis was confined to definite limited areas, the greatest portion of the hypertrophied tissue being free from inflammatory infiltration. We have seen one case where the prostatitis was entirely confined to the peripheral non-hypertrophied portion of the prostate. Indeed, one seldom sees any prostatitis in the areas where the most active gland proliferation is in progress.

Lastly there is distinct evidence of gland proliferation such as one sees in other glandular organs.

Arteriosclerosis.—The arteriosclerotic theory of Guyon has practically no adherents to-day. Casper insists on the rarity of arteriosclerosis, only finding it in four out of 24 hypertrophied prostates examined and practically all recent writers are of one accord on this subject.

In 54 prostates we found only 10 with rather extensive arterial thickening. The arteriosclerosis when present is usually irregular in distribution in one portion and end-arthritis of considerable degree being present, and in other portions the vessels appearing practically normal.

Development of prostatic hypertrophy.—The different steps in the formation of the new gland acini can often be followed in the several areas of a section from a portion where active proliferation is present. The initial activity is in the epithelium, the epithelial increase resulting in a protrusion or folding of the epithelial lining towards the lumen of the acinus, this being the line of least resistance. We have seen numerous such pictures where the stroma had not yet followed, knuckles of epithelium projecting into the lumen without a supporting pedicle of stroma. At other points one sees delicate fibrils of connective tissue pursuing the epithelial proliferation and at a later stage fibres of smooth muscle entering into the composition of the pedicle of the new-formed villus. By the continued growth of these protrusions from the periphery the acinus becomes subdivided and new acini are formed. One sometimes sees two, three, or more acini, which are the direct descendants of a single original acinus. If the glandu-

lar activity is very pronounced the interacinous stroma may consist of but very delicate fibrils of connective tissue, but where the proliferation is slower the stroma is more abundant. It is the primary activity of the epithelium which stimulates the connective tissue and muscular elements of the stroma to activity.

Prostatic hypertrophy is not a diffuse hyperplasia of all portions of the prostate but a hyperplasia which begins in separate foci and results in the formation of more or less numerous spheroidal tumors (see Figs. H and I). That this hypertrophy always begins in the central group of glands can be readily seen by an examination of pathological specimens of early hypertrophy.

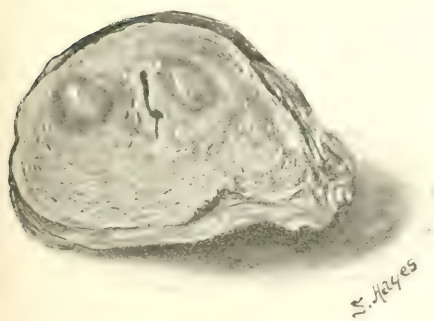


Fig. H.



Fig. I.

Fig. H.—A cross section of a prostate which represents an early stage of hypertrophy. The small spheroidal tumors have formed in the central portion and are compressing the tissue immediately surrounding them.

Fig. I.—A cross section of a hypertrophy somewhat more advanced than that seen in H. In the lower portion are visible the ejaculatory ducts and the dilated orifices of some gland acini.

Albarran in his classical studies on the disposition of the glands of the normal prostate has shown that they can be definitely divided into a peripheral and a central group of glands. The central group can again be divided into distinct segregations of glands and neoplastic processes occurring in one or more of these various groups produce the different anatomical varieties of prostatic hypertrophy. Should hypertrophy occur in the subcervical group of glands immediately beneath the vesical neck or in the prespermatic group, we have formed as a result a median lobe or bar.

As the hypertrophy in the central portion increases the peripheral tissue is condensed, thus forming a pseudo-capsule (see Fig. J).

It is inside this pseudo-capsule that the usual enucleation is performed. In the compression of the peripheral portion of the prostate the ejaculatory ducts are pressed towards the posterior surface so it is easy to understand why in some cases of suprapubic prostatectomy the ejaculatory ducts are not destroyed. The subcervical and prespermatic portions can be removed without disturbing them.

Nature of prostatic hypertrophy.—That prostatic enlargement is a true hypertrophy is very improbable since it begins at a period when the functional activity of the gland is on the decrease while the hypertrophies occurring in all other glandular organs are at a much earlier period. Furthermore, the hypertrophy is not diffuse but occurs in distinct well-defined areas. In great prostatic enlargements an



FIG. J.—The hypertrophy here is advanced still further than that seen in H and I. The central portion is entirely replaced by the hypertrophied tissue while the peripheral portion assumes the role of a thickened capsule in the periphery. The ejaculatory ducts are seen towards the posterior surface.

astonishing number of these "spheroids" may be present. Each of these, however, does not represent a primary tumor formation. The growth in an area undergoing hyperplasia is not always equal at every point, the result of this inequality being the production of numerous spheroids, the direct descendants of one primary focus of activity. The size of the hypertrophy depends upon the number and volume of these tumor formations.

These spheroidal tumors vary in their composition. Most frequently they are fibro-myo-adenomata, but all variations from an almost pure adenoma to pure myoma or fibroma are encountered. The pure myomata and fibromata are uncommon. In only one prostate have we

found myomatous nodules (see Fig. K), while in nearly every instance where the spheroids were entirely fibrous in character the condition seemed to be the result of a chronic prostatitis, vestiges of former acini

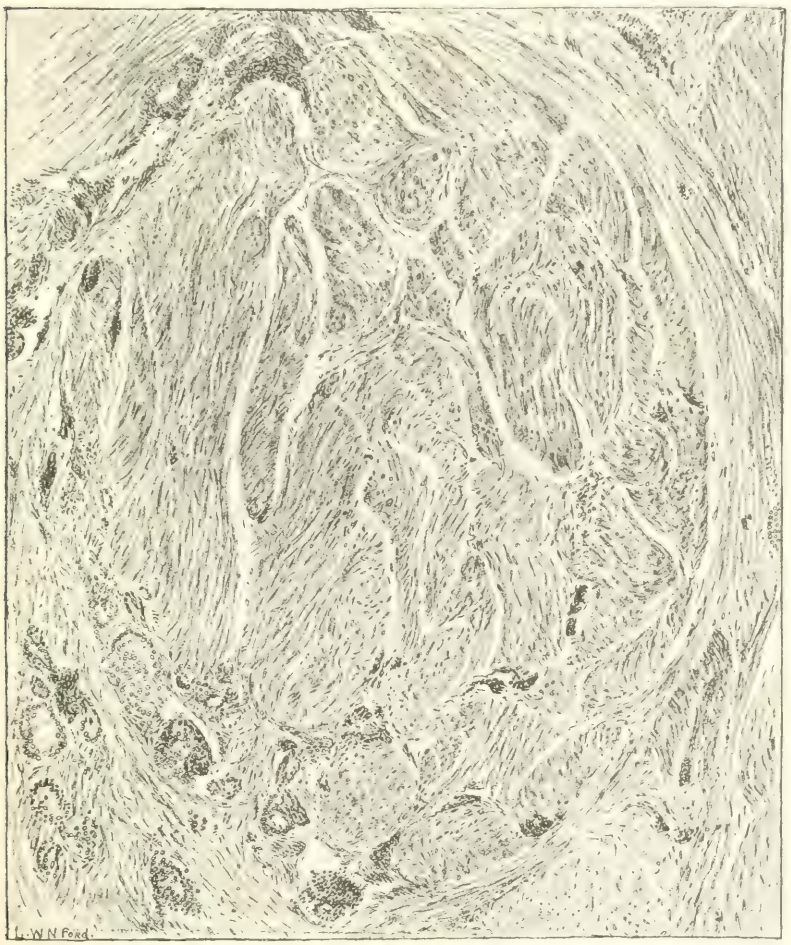


FIG. K.—A myomatous nodule. The myomatous hyperplasia is forcing the glandular elements towards the periphery where they form small accumulations of compressed acini.

occasionally persisting. The tissue forming the periphery of the spheroids usually contains sparsely scattered acini which are compressed and elongated. Occasionally in the interspheroidal stroma

areas of gland accumulation are seen which represent new tumors in the process of formation, the increase in growth not being sufficient to produce condensation of the surrounding tissue. At other times a partial condensation is noted.

Epithelioma adenoid.—Albarran and Hallè in their examination of 100 hypertrophied prostates obtained from autopsies at Hospital Necker found 14 carcinomata in prostates clinically diagnosed as benign hypertrophy. In a large number of these cases the macroscopic appearance did not suggest malignancy, and the picture was that of the ordinary benign hypertrophy. It was only on microscopic examination that in certain lobules adenomatous changes were discovered which to them suggested early or beginning malignancy. They have applied the term "epithelioma adenoid" to these changes and have classed as cancer all prostates containing areas in which such changes were present.

Out of 120 enucleated prostates which clinically were diagnosed as benign and in which on gross examination of the tissue no suspicion of malignancy was entertained in only one was distinct carcinoma found on microscopic examination. In this prostate a small carcinomatous nodule about 2 mm. in diameter was noted in an otherwise benign prostate (see No. 9 in paper on carcinoma).

We have not infrequently found areas where active gland proliferation was proceeding in which the epithelium lining the acini and the intraacinous papillary projections presented a rather wild profusion and showed some slight involution changes. These changes were never sufficiently marked to warrant more than a mere conclusion that the glands were displaying changes seen also in carcinomata and certainly would not justify a positive diagnosis of carcinoma.

It is very doubtful whether the deviations described by Albarran and Hallè should be considered malignant changes since adenomata may display so many variations, some of which may closely simulate malignancy, but still remain in the field of benign tumors.

Cases with sterile urine.—It seemed interesting to see whether in cases in which the urine is sterile the prostate would be free from inflammation.

In three cases, in which the urine was sterile and absolutely free from pus, the prostatic secretion was obtained by massage. In two

cases, the microscope showed no pus cells, and in the other only a very few polynuclear leucocytes were present. Spermatozoa were present in all three, along with lecithin and granule cells. Microscopic examination of the tissues removed by prostatectomy showed no prostatitis in one case in which no pus cells were present in the secretion. In the other case the specimen has been lost. In the third case in which a few pus cells were present in the secretion, the microscope shows a glandular hypertrophy with considerable interstitial and glandular prostatitis.

In seven cases in which the prostatic secretion was obtained, where the urine contained pus and bacteria, pus cells were present in considerable number in all cases, and the microscope showed considerable prostatitis in the tissues removed at operation.

The urine was sterile in 18 cases, five of these, however, contained free pus in all three glasses and the sections show prostatitis. In one case shreds were present in the first glass of urine, but the second and third glasses were clear. The specimen at operation has been lost.

The urine was clear, contained no pus or bacteria in 12 cases. Eight of these had never had gonorrhœa, but in two cases calculi were present, and in both of these considerable prostatitis was found. In the six cases in which no calculi were present, three showed no evidence of prostatitis. In one specimen there were only a few areas of inflammatory infiltration and in one there was considerable prostatitis, both glandular and interstitial. The specimen from the sixth case was lost.

Among the 18 cases in which the urine was sterile pain was present in 10 cases and all showed evidence of more or less considerable prostatitis on microscopic examination of the specimens.

In eight cases no pain had been present. In four of these the specimen showed no inflammation, and in two cases it was very slight, there being only a few leucocytes seen. In two cases, however, there was considerable prostatitis present.

K. CONCLUSIONS.

Prostatic hypertrophy is of neoplastic nature and in the vast majority of cases is of an adenomatous or fibro-myoadenomatous form.

Pure myomata and fibromata are occasionally seen.

The characteristic lesion of hypertrophy is the formation of spheroidal tumors which arise in the central group of glands.

The primary activity is in the epithelium of the acini.

Chronic prostatitis may produce obstruction similar to true prostatic hypertrophy, but does not lead to a true hypertrophy of the gland.

That perineal prostatectomy is applicable to all forms of prostatic hypertrophy, even the greatest intravesical enlargements being easily removable through the perineum (one of my cases weighing 240 gm.) is shown by the cases reported here.

The ease of access to the prostate, the excellent view obtained, and the ability to use other instruments than the finger, make it the only reasonable method of attacking a non-enucleable fibrous prostate.

The fact that a large percentage of enlarged prostates are carcinomatous, and that these if taken early can be completely eradicated through the perineum by an operation described in another portion of this volume renders it the only justifiable route in many cases which may be shown to be cancerous by frozen sections prepared at the operation while the operator awaits their decision.

While some prostates can be shelled out more quickly through the suprapubic region, the convalescence is longer, more disagreeable and more fatal than after the perineal, and it is the operator's duty to consult his patient's welfare rather than his personal convenience.

The method of conservative perineal prostatectomy employed in the preceding cases affords an excellent view of what one is doing, avoids injury of all important structures, preserves the urethra, ejaculatory ducts and vesical sphincter intact, so that control is sometimes established immediately after the operation, and permanent incontinence never results from it.

The fact that there was a mortality of only 4.3% in 163 cases, five of whom were over 80, one 87, and 21 over 75 years of age, that many of these patients were in bad condition and two in extremis, that the earliest death was eight days after the operation, and the majority were after the third week, that the cause of death in not one case was immediately due to the operation, and that during the past 14 months* there has not been one death in 50 cases shows that it is a method of wonderful benignity.

The absence of stricture and incontinence, and also of rectal fistula

*Nov. 16, 1906. There have now been over 50 consecutive cases without a death, and all have been entirely successful.

(since its cause and remedy were discovered) show that they are bugaboos held out against a procedure by those who have never tried it.

The complete restoration of normal urination, except when some cystititis and vesical contracture was present, and the lasting results obtained testify to the completeness of the removal, except in the four cases given above in which the operator did not do what the cystoscope showed should be done, and are not to be placed against the method.

The complete return of sexual powers in nearly all cases where present before operation and the wonderful restoration of lost puissance recorded in five cases show the value of the conservation of the ejaculatory ducts, a point which the infrequency of epididymitis (12%) also attests. These results demonstrate that with a careful anatomical technique, avoiding non-obstructive and valuable structures (the external and internal sphincters, the urethra and ejaculatory ducts) with the excellent drainage afforded through the perineum, perineal prostatectomy is a benign procedure, applicable to all forms of prostatic enlargement, affording a much quicker and more comfortable convalescence than suprapubic prostatectomy, and followed by permanent results as good as could be expected or desired.

After having tried both the suprapubic and Bottini methods, and having employed them in 30 and 85 cases, respectively, I feel I can say with all sincerity that the results obtained by me did not compare in any way—mortality, convalescence, ultimate results, and restoration of normal functions—with the results obtained by " Conservative Perineal Prostatectomy."

I wish to thank Dr. Halsted and Dr. Bloodgood for many courtesies.

Literature.

Albarran and Hallé. Annales des Maladies des org. gen. urin. Feb. and Mar., 1900.

Voilleime et Le Dentu. Traité des maladies des voies urinaries, Vol. II.

Rindfleisch. Traité d'Instal. pathol., p. 627.

Motz. Contrib. a l'étude d'hyp., de la Prostate, Th., Paris, 1896; Annales des Maladies des org. gen. urin., Oct., 1905.

Socin. Krank. der Prostata.

Velpean. Quoted by Motz above.

Jores. Handbuch der Urologie, by Von Frisch.

Gouley. New York Med. Record, 1890, No. 1.

Ciechanowski. Ann. des Maladies des org. gen. urin., 1901.

APPENDIX.

Detailed Report of Individual Cases in 145 Operations by Conservative Perineal Prostatectomy for Benign Hypertrophy.[9]

Case 1.—*Moderate enlargement of median and lateral lobes of the prostate. Catheterism. Cured.*

No. 726. S. T. A., age 66, married, admitted October 11, 1902. No history of gonorrhœa nor previous urinary trouble. Onset began six years ago with slight difficulty of urination. During the next four years there was a gradual increase in the difficulty and frequency and occasionally a slight incontinence. About six months ago a physician treated him by dilatation of the posterior urethra, under which treatment the patient rapidly grew worse, and for the past two months retention has been complete and the catheter necessary from four to six times a day. He has suffered a great deal of late with tenesmus in the lower abdomen, especially during the trip which he has just made from Honolulu to Baltimore. Recently he has been able to void very small amounts of urine, but if he is not catheterized every four or five hours he suffers very severe pain in the bladder. Catheterization at times is very difficult and considerable hemorrhage is produced. He is now weak and exhausted from his long trip.

Examination.—The patient is a thin, weak, very sick looking man. A harsh, aortic, regurgitant murmur is present. Examination of kidneys negative. On the lower portion of the abdomen are several severe burns due to hot water compresses. He is unable to void urine. A small coudè catheter passes with ease; 350 cc. of urine evacuated. The cystoscope shows two moderately enlarged lateral lobes joined by a median bar without intervening sulci. The bladder wall is considerably inflamed, markedly trabeculated with numerous pouches and some diverticula. The ureters cannot be seen.

Rectal examination.—The prostate is considerably enlarged, smooth, round, elastic, fairly soft and not nodular. Urine is acid. Specific gravity 1018. Albumin, fairly heavy cloud. Pus and bacilli in great numbers.

Preliminary treatment.—For two weeks the patient was catheterized about every three or four hours and the bladder irrigated. Water and urotropin in abundance were administered by mouth. Under this treatment the irritability of the bladder disappeared and the patient became

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[9] It has seemed necessary to give all the details of the cases, although consuming great space. The numbers given are those of my office index, unless " S. No." is used, when the surgical No. of the Johns Hopkins Hospital is supplied. In the later reports from patients by letter, quotation marks are not used because their replies have been abbreviated so as to save space.

much stronger. The total quantity of urea varied from 6 to 11 grams daily, and although this amount was very small, the patient seemed strong enough to attempt the radical operation.

Operation, October 24.—Ether. An inverted Y-shaped incision was made in the perineum. The central tendon and recto-urethralis muscles were divided, and the posterior surface of the prostate divided by blunt dissection. The urethra was then opened upon a sound in the membranous



Fig. 39a.

urethra, and after dilatation of the prostatic urethra the single-bladed tractor, Fig. 39a (which was the first instrument which I had made for this purpose) was passed into the bladder with ease, and the beak turned downward over the median portion of the prostate. Traction was then made, and it was found possible to draw the prostate so far downward that it was almost on a level with the skin. A transverse incision was then made in the prostatic capsule near the apex. A blunt dissector was



Fig. 40.—Lateral lobes, median bar, and floor of urethra removed in one piece.

inserted and the posterior capsule rapidly freed from the prostate. The lateral surfaces were likewise freed. An effort was then made to strip the lobes from the urethra, but with only partial success, and when the prostate had been completely enucleated it was found that the entire floor and a portion of the lateral walls of the urethra (and the ejaculatory ducts) had been removed in one piece. The specimen removed consisted of the two lateral lobes joined by the median bar, as shown in Fig. 40.

A small retention catheter was passed through the perineal wound into the bladder. The lateral cavities were not packed with gauze, but the packing was placed outside of the capsule so as to force it up against the urethra and form a new floor. The levator muscles were brought together on each side by silk sutures and the skin wound partially closed with interrupted sutures. The patient was infused on the table.

Convalescence.—Immediately after the operation the large single drainage tube became plugged with blood clots, and the bladder became distended with urine, necessitating the removal of the gauze and tubes before the clot could be removed and the urine evacuated. Considerable difficulty was experienced in introducing another tube, there was considerable hemorrhage and the patient was quite shocked. The wound was repacked with gauze and after that the patient reacted well. Perineal drainage was kept up for about a week when the perineal tubes and gauze were removed. Subsequently a retention catheter was placed in the urethra to facilitate closure of the fistula.

On December 8 the following note was made: The patient voids urine without difficulty at intervals of about three hours. There is no incontinence and the stream is large. On November 3 examination showed the bladder capacity to be 210 cc. The bladder has been dilated through a catheter, and it now holds 460 cc. and the patient can void as much as 300 cc. at a time. He has had slight epididymitis. The patient was discharged December 8, 1902, on the 45th day. He was able to retain urine for three hours and voided naturally, but a slight fistula was present, and this finally closed four months after the operation.

January 1, 1903.—I void urine once at night and have gained eleven pounds in weight.

May 28, 1903.—I void urine naturally four times during the day and once at night. There is no incontinence. I have erections, but have not attempted intercourse.

February, 1904.—I can retain urine from six to eight hours. Urination is satisfactory. I have no pain; erections occur occasionally, but I have not attempted intercourse. My general health is excellent.

Note.—The patient took a trip to South Africa and lost his life in an accident at Victoria Falls, September 10, 1904.

Pathological report.—Specimen, G. U., 63. The entire prostate has been removed in one piece and weighs about 50 grams. The union between the median bar, which measures about 2 x 3 cm. in size, and the lateral lobes has not been disturbed; and the mucous membrane covering the front of the median bar and a portion of the internal surfaces of the lateral lobes has been removed along with the lobes. The external surface shows numerous small lobules covered by a smooth capsule, and the section shows some enlarged spheroids in an enlarged stroma. The consistence is everywhere elastic.

Microscopic examination.—The hypertrophy is a glandular one. The acini are dilated and show considerable papillomatous intra-acinous growth.

The epithelium lining the acini in most areas shows a rather profuse proliferation. The glandular tissue is arranged for the most part in lobules, the periphery of the lobule is composed of compressed stroma containing elongated acini. In the middle lobe there is present a marked prostatitis with the formation of a great deal of scar tissue in the stroma which in places has almost completely obliterated the acini. The arteries in these rather fibrous areas show considerable thickening, while in the glandular areas they seem about normal. There is a moderate amount of muscle present in the stroma except in the areas where there has been a formation of quite marked inflammatory tissue.

CASE 2.—*Considerable enlargement of median and lateral lobes. No complication. Cure. Followed 42 months.*

No. 368. J. W. L., age 59, married, admitted December 6, 1902. Old Dominion Hospital, Richmond, Va.

Complaint.—"Frequency and difficulty of urination."

No history of gonorrhœa.

In 1893 patient had nephritic colic, and a second attack in 1898, no other colic since then but has frequently passed sand.

Present illness began in 1895 with frequency of urination, this gradually increased, and in 1898 complete retention of urine requiring catheterization came on. Since then has had frequent and difficult urination and occasionally retention requiring catheterization.

S. P.—Urination every hour with great difficulty. No history of hematuria or pain. Has lost about 20 pounds in weight.

Sexual powers.—No note made.

Examination.—The patient looks pale, but his muscular strength seems good. The heart, lungs and abdomen negative. There is a small inguinal hernia present.

Rectal.—Prostate is considerably enlarged, about the size of a small orange. It is rounded, smooth, symmetrical, elastic, there are no nodules or areas of induration. The seminal vesicles are not palpable.

Cystoscopy.—A silver catheter passes with ease and finds 165 cc. residual urine, and a bladder capacity of 250 cc. Cystoscopy is impossible on account of hemorrhage.

Urinalyis.—Acid, albumin in small amount, no sugar, urea G-25 in 24 hours. Microscopically, pus cells and bacilli.

Operation, December 6, 1902.—Chloroform. Perineal prostatectomy. In this case I decided to operate by a different technique so as to preserve, if possible, more of the prostatic urethra than I had in Case 1. The inverted Y-incision was used, the bulb and central tendon exposed, and central tendon and muscle beneath it were divided. The levators were separated by the fingers, thus exposing the membranous urethra which was incised upon a grooved director just in front of the apex of the prostate. A large sound was passed into the bladder through the opening and the single bladed tractor easily inserted into the bladder and turned downward over

the median portion of the prostate. Outward traction was then made, drawing the tractor well up into the wound. A V-shaped incision was made through the prostatic capsule, the point being forward near the apex of the prostate. With a blunt dissector the capsule was then rapidly stripped back from the posterior surface of the prostate until the entire posterior and lateral surfaces had been separated from the capsule which was thus turned back as a cuff. In order to preserve the urethra the prostate was then bisected, beginning in the median line at the apex and extending backward for 1½ cm. In order to separate the urethra from the lateral lobes it was found necessary to make a longitudinal incision on each side with the scalpel parallel to the urethra. A blunt dissector was then inserted and the urethra rapidly stripped away from the inner surface of each lateral lobe (this was practically the method of Proust which I had not heard of at that time). The lateral lobes were then enucleated and removed each in one piece, the tractor being turned so as to engage each lobe, while it was being enucleated. A median lobe 2 cm. in diameter was then drawn down by the tractor into the urethra and enucleated together with a narrow strip of mucous membrane which covered its anterior surface, the verumontanum and the terminal portions of the ejaculatory ducts. During this operation considerable difficulty was experienced in employing the tractor which continually slipped out and had to be introduced with considerable difficulty. (This led to the addition of a shoulder to the end of the blade to prevent its slipping out). A large retention catheter was passed into the bladder. One small piece of gauze was packed into the prostatic cavity and two pieces were placed back of the prostatic capsule, the object being to cause the collapse of the cavity after removal of the piece of gauze from the interior of the capsule. The separated levator muscles were joined with sutures of catgut and the wound was partially closed with catgut externally. The patient stood the operation well. Saline infusion.

Convalescence.—The patient reacted well. The highest temperature was 100.50. When last seen by the operator, 30 hours after the operation, his condition was excellent. He was discharged on the 14th day in excellent condition.

May 24, 1904.—Letter. The wound has remained closed. I void urine with perfect satisfaction at intervals of from two to four hours during the day and four to six hours at night. I suffer no pain and my general health is excellent.

May 20, 1906.—Letter from physician. Micturition is normal. He voids about every three hours during the day and one to three times at night. There is no evidence of stricture and very rarely a little dribbling. His condition is fine.

Pathological report.—Specimen, G. U. 60. The entire prostate has been removed in three pieces and weighs 70 grams. The median lobe measures 3 x 2 x 1½ cm., the lateral lobe, each 5 x 4 x 3 cm. The summit of the median lobe is covered by mucous membrane about 1½ cm. in diameter.

The appearance of the lobes exteriorly and on cross section is that of numerous spheroids; they are elastic and there are no areas of induration.

Microscopic examination.—The hypertrophy is a moderately glandular one, areas rich in acini and forming spheroids alternating with areas containing rather a large amount of stroma. Often the tissue outside of these spheroids contains numerous culs-de-sac, showing signs of activity. The stroma contains a large amount of muscle, at times being considerably in excess of the connective tissue. There is present in areas a well marked chronic prostatitis and the blood vessels exhibit a moderate degree of arteriosclerosis.

Case 3.—*Moderate hypertrophy of prostate. Catheter life 14 years. Tabes dorsalis of 16 years' duration. Restoration of normal urination. Followed 5 months.*

No. 297. T. C. L., age 60, married, admitted November 17, 1902.

Complaint.—"Enlarged prostate. Catheterism."

Gonorrhœa many years ago, and was perfectly cured.

In 1863 had a sore on the penis which he thinks was syphilitic. His physician told him that he had blood poison and gave him internal treatment which he took for a month. Sixteen years ago he began to have sharp severe pains which came on suddenly, and were localized in the right thigh and later in the right leg. No trouble with bladder, rectum or locomotion at that time.

Present illness began 14 years ago with difficulty and frequency of urination. About the same time he began to have incontinence of urine at night. After three months his condition was not improved, and his physician passed a catheter withdrawing about a quart of residual urine. The diagnosis of enlarged prostate was made. Following this examination the patient had a chill, fever and pain in the region of the left kidney. He was unable to pass urine except in very small amounts and with great difficulty and began a catheter life which has continued up to the present time. He has continued to suffer greatly from "sciatica." Two years ago he noticed for the first time an instability of gait, particularly at night. Recently his eyesight has become impaired.

S. P.—The patient is unable to void and catheterizes himself five times a day. His general health is good, has not lost weight, but he still suffers from an occasional attack of "sciatica," and instability of gait.

Sexual powers.—Erections have been absent for many years. He finds the catheter life a terrible burden and begs to be relieved from it.

Examination.—The patient is a sparely built, but healthy-looking man with lips of good color. The chest and abdomen are negative.

Examination of nervous system by Dr. Thomas.—Vision good, optic nerves are normal. The pupils are contracted, there is no reaction to light and very slight reaction to accommodation, the other cranial nerves are normal. The walk is slightly ataxic. There is a marked swaying with his feet together and eyes closed. The knee and ankle jerks are absent.

There is a marked lack of muscle tone and a retardation of the perception of pain throughout the legs. No other very pronounced sensory disturbance.

Diagnosis.—Tabes dorsalis with unusual involvement of the bladder.

Rectal.—The prostate is moderately but very definitely hypertrophied, forming a bulging rounded mass about the size of a small orange, smooth, elastic, but harder than usual. The lateral lobes are about equally enlarged, the median furrow and notch are obliterated. The seminal vesicles are not indurated, and there are no palpable glands. The sphincter ani is peculiarly lax and atonic and the rectal mucosa is very redundant.

Cystoscopic.—A coudè catheter enters easily, retention of urine is complete, bladder capacity 600 cc., the tonicity poor. The cystoscope shows a definite rounded intravesical hypertrophy of both lateral lobes and fairly deep sulcus between them in front, and a small median lobe with a shallow sulcus on each side. The ureters could be easily seen and they are situated in prominent ridges. The bladder wall is only slightly trabeculated and there are no large ridges with deep pouches intervening.

Urinalysis.—Cloudy, alkaline, sp. gr. 1022, no albumin, no sugar. Total quantity of urine 760 cc. Total urea G-14.5. Microscopically, pus cells and bacteria.

Note.—It seemed very evident from the history and age of the patient that the urinary trouble, which began 14 years before, was due to tabes. There was no question, however, of the fact that the prostate was then distinctly hypertrophied, and that possibly prostatectomy might restore normal urination, though it might also lead to incontinence. The patient was going to Boston, and I asked him to see Dr. A. T. Cabot, who advised prostatectomy. Dr. H. M. Thomas, who, after careful examination, had confirmed our diagnosis of tabes dorsalis, thought that prostatectomy might have the desired effect. The patient was so anxious to get rid of the catheter that he gladly accepted the chance of continual incontinence.

Operation, Dec. 9, 1902.—Ether. Perineal prostatectomy. This was the third case operated upon, and the following technique was used. A median line perineal incision, insertion of a single-bladed tractor through urethrotomy of membranous urethra. Inverted V-incision through capsule of prostate which was stripped back, thus exposing the posterior surface of the prostate. Hemisection of the urethra was then performed in the median line, and the urethra separated from each of the lateral lobes beginning with an incision and completed by blunt dissection. The lateral lobes were then enucleated each in one piece. The right lobe measured 3 x 3 x 4 cm. The left lobe 3 x 4 x 4 cm. Examination of the median portion showed very little enlargement, not sufficient to warrant removal. Large drainage tube was placed in the bladder through the perineal wound, the capsule was drawn forward and sutured so as to surround the tube. Two gauze packs were placed back of the prostatic capsule with the object of obliterating it. The levator muscles were drawn together with sutures and the skin wound partially closed. Infusion at end of operation. Pulse 94, condition excellent.

Convalescence.—The patient reacted well. The temperature rose to 101° for three days after the operation, after which it was practically normal. He suffered greatly from severe attacks of pain in both legs, which came on suddenly and were very severe, but lasted only a few minutes. Intravesical irrigations of boric acid were given twice daily until the tube was removed on the ninth day. The gauze was removed on the next day and the patient was gotten up in a wheel-chair. Two weeks after the operation urine began to flow through the meatus. The retained catheter was then placed in the urethra, where it remained for eight days. After its removal there was no leakage through the perineum, which remained healed. He was discharged from the hospital on the 42d day. At that time he was able to retain urine for three hours during the day and eight hours at night. There was no dribbling at all during the night, and during the day there was only occasionally when walking about an involuntary escape of a few drops of urine. Micturition is slow, but without difficulty, and when the bladder was quite full the stream was good. A catheter was passed with ease and found no residual urine. The bladder had become slightly contracted and would hold only 340 cc. The vesical tonicity was better than before operation, but was still only moderately good. The patient was instructed to use urotropin two or three times a day, and to irrigate the bladder with boric acid.

February 6, 1903.—"While irrigating the bladder by hydraulic pressure the perineal wound broke open again. There is now slight leakage, otherwise the condition is good."

March 12, 1903.—"I am able to urinate all right, but the perineal fistula is still open and a few drops of urine escape through it during urination." He was advised to cauterize the wound.

May 21, 1903.—Letter from wife. On March 16 the patient had a sudden severe collapse which was thought to be uremic. He seemed to rally from this, but the old enemy "neuralgia" kept coming with the least exposure to cold and these attacks kept him indoors. The strain weakened him, and finally the stomach lost its tone, his appetite failed, the bowels became affected, dysentery set in, and at the end of two weeks death ensued, May 20, 1903.

Pathological report.—Specimen, G. U. 61. The prostate has been removed in two pieces and weighs 50 grams. The right lobe measures 5 x 4 x 3½ cm., the left 4.5 x 4 x 3 cm. No mucous membrane has been removed. Externally and on section numerous small lobules and spheroids are seen. There are no areas of induration nor suggestion of malignancy.

Microscopic examination.—The hypertrophy is a moderately glandular one. The acini are grouped in small spheroidal areas, and the interlacing stroma contains but very few acini. The stroma contains a fair amount of muscle, but the connective tissue is somewhat in excess. The blood vessels show a marked degree of arteriosclerosis.

Case 4.—*Moderate hypertrophy of median and lateral lobes. Vesical calculus. Cure. Followed two years.*

370. J. P. D., age 57, married, admitted Dec. 17, 1902.

Complaint.—"Frequent and painful urination."

The patient never had gonorrhœa.

Present illness began about 17 years ago with slight difficulty and increased frequency of urination. About five years ago he had complete retention of urine and had to be catheterized for two days. Since then he has had complete retention at gradually lessening intervals, but always after two days he would be able to void again. He has had a pain occasionally during and at the end of urination, but there has been no pain in the rectum.

S. P.—The patient now voids three or four times during the night in a small, slow stream. He does not use the catheter unless unable to urinate. Sexual powers present.

Examination.—Well nourished man with lips of good color. Heart, lungs, abdomen, and genitalia negative.

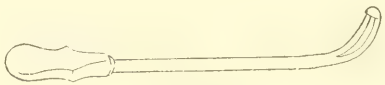


Fig. 40a.

Rectal.—The prostate is considerably and equilaterally enlarged, about the size of a small orange. Smooth, rounded, elastic but not soft. The seminal vesicles are not palpable.

Cystoscopic.—A small coudè catheter passes with ease withdrawing 75 cc. residual urine. The bladder capacity is 340 cc. The cystoscope shows a slight intravesical enlargement of the lateral lobes joined by a small median bar. No calculus seen. Examination unsatisfactory on account of hemorrhage.

Urinalysis.—1020, neutral, no sugar, no albumin, microscopically, pus cells.

Preliminary treatment for four weeks, catheterization and irrigation of bladder. During this period had complete retention of urine several times and catheter withdrew 500 cc. of urine.

Operation, January 10, 1902.—Ether. Perineal prostatectomy. This is the first case in which an attempt was made to preserve the ejaculatory ducts by means of bilateral capsular incisions. The lateral lobes were enucleated, and the median bar was removed in two pieces through the lateral cavities. The incisions were made very superficially, and it was found very difficult to separate the lateral lobes from the urethra. The ejaculatory bridge, however, was not very badly torn and none of the mucous membrane of the urethra was removed. The original single blade prostatic tractor was used and, although it had been provided with a "harb" (see Fig. 40a), after the lateral lobes had been removed the

instrument slipped out of the bladder and was very difficult to introduce again. The need of an instrument which would not slip out was forcibly impressed upon us and led to the construction of the double-bladed rotating tractor. The lateral cavities were packed with gauze and a single large drainage tube was placed through the perineum into the bladder. Patient stood operation well, pulse at end 80, infusion on return to ward.

Convalescence.—About 12 hours later the drainage tubes became plugged with a clot of blood and were accidentally removed by the orderly. The interne experienced a great deal of difficulty getting the tube back into the bladder and considerable hemorrhage occurred. On the fourth day the drainage tube was finally removed. On the seventh day the patient was allowed to get up in a wheelchair, but on the fourteenth acute epididymitis set in and went on to abscess formation, which was incised five weeks after the operation. During the seventh week the patient passed a small calculus, and after that seven or eight others. During the third week after the operation most of the urine was coming through the urethra. The temperature reached 102° on the fourth day, but after the seventh day remained normal until March 1, when temperature rose to 103.8° followed by a urethral chill.

March 8, 1903.—A catheter passes with ease and there is no residual urine. The bladder capacity is 350 cc. The cystoscope shows a small mass of granulation tissue in the anterior portion of the trigone just back of the median portion of the prostate, and on top of this is a calculus of small size, but firmly fastened to it. There is no free calculus in the bladder. The prostatic margin is irregular, but there is no evidence of prostatic hypertrophy. The perineal fistula is very small, only a few drops escape through it and the patient is able to retain his urine well. An effort was made to dislodge the calculus with the cystoscope.

March 25, 1903.—Two calculi have been passed since the cystoscopic examination. The cystoscope shows no calculi present and the mass of granulation on which one was incrusted has entirely disappeared. In the anterior portion of the prostate several large granulations are seen. With the finger in the rectum and cystoscope in the urethra the amount of tissue between the two is less than normal.

March 27, 1903.—The patient is discharged. Condition is excellent. Both epididymes are indurated, small fistula is still present. The patient voids at intervals of five hours with a large stream and perfect control.

Letter, January 20, 1904.—The fistula closed four months after the operation. I now urinate once during the night and at intervals of three to four hours during the day. I have not used a catheter and urination is satisfactory. Occasionally I have a slight pain in the bladder. I have erections once or twice a week and have sexual intercourse.

June 4, 1904. Letter. I can hold my urine six to eight hours at night and four hours during the day . Urination is normal, but I have a slight pain occasionally in the bladder. I have erections and intercourse, but ejaculations are not normal.

January 18, 1905.—I am cured with the exception of a slight pain which I occasionally have in the bladder. I have had no instrumentation since my discharge. I urinate once at night and three to six times in the day, and pass large amounts. Erections and intercourse are present, but are not as satisfactory as before operation. My general health is excellent.

December 7, 1905.—Letter from wife. My husband died September 12, 1905, of catarrh of the stomach.

Case 5.—*Moderate enlargement of lateral lobes. Pain suggesting renal calculus. Cure. Followed 20 months.*

No. 289. J. S. S., age 65, married, admitted January 14, 1903.

Complaint.—"Bladder trouble."

Gonorrhœa in his youth was cured without complications.

Present illness began 15 months ago with pain at the beginning of urination which radiated from his bladder upward along the right side and apparently terminated in his right kidney. The pain was very severe in character, lasting about three minutes, at no time radiated to the penis and was not associated with hematuria. Irrigations of the bladder seemed to relieve him. During the next month every time he urinated he had a pain which seemed to start from a point deep down in the pelvis, and from there traveled upward to beneath ribs on the right side. There was no pain in the testicles, thigh, bladder or penis. Urination was markedly frequent and the amounts voided small. Considerable difficulty in starting the flow of urine. He then went to a mineral springs and the pain disappeared. In August, 1902, a physician pronounced his case catarrh of the bladder and gave him a catheter to use. In November he went to another physician who writes as follows: His urine was filled with pus, the prostate was inflamed and tender. A catheter found 10 ounces of residual urine. I treated him by irrigations, massage of the prostate, instillations. He now has a residual of four ounces. Urine is voided more easily and his general health is better. There is still pain in the region of the bladder.

S. P.—There is considerable hesitation at the beginning of urination, and a pain at the end which is dull in character and occasionally travels upward from the bladder towards the right kidney, but is not nearly so severe as at onset. There is no great increase in the frequency of urination, and he often only gets up once during the night.

Sexual powers.—Sexual desire has been absent for the past six months, previous to which coitus was normal.

Examination.—The patient looks well. Lips of good color. Heart and lungs negative. There is no tenderness in the region of either kidney and no enlargements to be made out.

Rectal.—The prostate is moderately but symmetrically enlarged, and the median furrow is broad and shallow. The surface is slightly irregular towards the upper end, but the consistence is generally elastic. The seminal vesicles are not indurated.

Cystoscopic.—A coudè catheter passes with ease and finds 160 cc. residual urine. The bladder capacity is 700 cc. The cystoscope shows two

fairly large intravesical enlargements of the lateral lobes with a deep sulcus in front and a deep sulcus behind. A small transverse fold of mucous membrane was seen in the median portion of the prostate connecting two lateral enlargements. The bladder is remarkably trabeculated with numerous small pouches.

Urinalysis.—Cloudy, acid, 1010, albumin in small amount. Urea 23-G. per liter. Microscopically, pus cells, a few hyaline casts and bacilli.

Operation, January 20, 1903.—Ether. Perineal prostatectomy. The technique which is now employed was used in this case with the exception that the single-bladed tractor was used. The bilateral capsular incisions which have been used with the idea of preserving the floor of the urethra and ejaculatory ducts were made. The right lateral lobe came away in one piece, and measured 2 x 3 x 3 cm. The left lateral lobe came away in three pieces which together form a mass larger than the right lobe. The tractor was then withdrawn and the finger inserted and showed no enlargement of the median portion of the prostate. The entire urethra and ejaculatory ducts were preserved intact. The tractor employed in this case was the single-bladed tractor with a shoulder across the front of the blade at its end. The same difficulty was experienced from its slipping out of the bladder when one lobe had been removed. Two catheters were fastened together and placed in the bladder for drainage. This was done because in previous cases difficulty had been experienced on account of the single drainage tube becoming plugged with blood. Gauze packs were placed two in the capsule of the prostate and two behind it, the latter to be removed last and thus obliterate the cavity left after removal of the first. Levator muscles were brought together with several catgut sutures and the skin wound partially closed.

Convalescence.—The patient stood the operation well, but the pulse at the end was very rapid, 140 to the minute. He was infused on the table and half an hour after the operation his pulse had fallen to 88, and his condition was excellent. The highest temperature was 100.8° on the day after the operation. After four days it was normal. Continuous irrigation was maintained for seven days when the tubes and gauze were removed. Urine began to come through the anterior urethra on the 14th day. On the 12th day the patient began to walk. The perineal fistula closed finally on the 18th day, and the patient was discharged on the 21st day. At that time he was voiding urine freely at intervals of five hours and felt perfectly well.

March 15, 1903.—I void urine naturally at intervals of from six to eight hours. Have a slight pain in the groin, otherwise feel perfectly well.

Sept. 28, 1903.—Letter from physician. The patient is perfectly well, very seldom rises at night to urinate. He has complete control, no dribbling.

October 6, 1903.—Letter. I do not get up at all to urinate at night, am free from pain. I have had no erections as yet.

May 20, 1904.—I void urine naturally at intervals of seven or eight hours

at night, four or five during the day. I suffer no pain. Urination is normal. Erections have returned.

March 9, 1905.—Letter from physician. The patient died September 9, 1904. Previous to his death urination was normal. He seldom had to rise during the night to urinate. There was about 15 cc. residual urine, and the bladder capacity was over 500 cc. He had been entirely free from all pain for some time. Erections and sexual powers were normal, and his ejaculations were satisfactory. He died suddenly while sitting in a chair from angina pectoris.

Case 6.—*Large hypertrophy. Catheter life eight years. No stone. Cured.*

No. 341. S. T. A., age 70, single, admitted February 28, 1903, complaining of obstruction to urination, and catheterism for eight years. He has never had gonorrhœa nor any previous urinary trouble.

P. I.—Onset 15 years ago with slight frequency and difficulty of urination which grew gradually worse during the next seven years until finally he was urinating from five to eight times during the night. He then consulted a physician who catheterized him and found a large quantity of residual urine. Since then the patient has never been able to void urine naturally and has catheterized himself three to four times a day.

S. P.—The patient is using a catheter three times a day, and is unable to void any urine naturally. Occasionally he suffers a slight pain in the rectum, and urethra and sometimes catheterization causes considerable hemorrhage. Erections have been absent for five years.

Examination.—Lungs negative. Heart: An aortic insufficiency is present, but no dilatation of the heart. Abdomen negative. The prostate by rectum is considerably hypertrophied, the left lobe larger than the right. The contour is rounded, surface smooth, consistence elastic, no induration present.

Cystoscopic examination.—The patient is unable to void urine. A soft rubber catheter passes with ease, and the bladder is easily washed clean. Examination of the prostatic orifice shows a moderate-sized median bar, a considerable intravesical hypertrophy of the left lateral lobe attached to which is a fairly large anterior lobe. The right lateral lobe is not intravesically enlarged. There is considerable trabeculation of the bladder wall, chronic cystitis of moderate degree. No calculus present. The urine is acid, specific gravity 1019, no sugar, no albumin. Microscopically, pus cells, bacilli and cocci. Urea .024 G. per 1 cc.

Preliminary treatment for 10 days, during which the patient was catheterized, the bladder was irrigated, and urotropin administered internally. Study of the urine showed no evidence of kidney disease, and although the patient was a rather weak old man, prostatectomy was decided upon.

Operation, March 10, 1903.—Ether. Perineal prostatectomy. Enucleation of a small right lateral lobe, and a very large left lateral lobe with the median bar and anterior lobe attached to it. The regular technique was followed. The ejaculatory ducts and urethra were preserved, and only a

small area of mucous membrane covering the anterior lobe was removed. The wound was closed as usual. The levators were not approximated. Saline infusion of 1200 cc. of salt solution on the table. Double catheter drainage provided through perineal wound. There was only a moderate amount of hemorrhage and the patient stood the operation well.

Convalescence.—The drainage tubes became plugged with a blood clot and had to be removed two hours after the operation. Evacuation of clots consumed considerable time and the patient was quite shocked for a short while. The tubes were removed on the seventh day. On the 21st day the urine still came entirely through the perineum and a retained urethral catheter was applied. The perineal fistula did not close completely until two months after the operation. No epididymitis.

Examination, May 29, 1903.—(Two and one-half months after operation). The catheter has not been required since operation. Urine is voided in a large stream at intervals of three hours. There is no incontinence, no hesitation, and perfect control. The fistula is closed, his strength is good. The catheter passes with ease. Residual urine 25 cc. Bladder capacity 240 cc. Discharged on the 83d day.

Remark.—The result is excellent, but the patient is advised to dilate the bladder by hydraulic pressure to increase its capacity and the interval of urination.

Final note.—The patient remained well for five months. He then died suddenly of some intercurrent disease, the nature of which was not clear. His physician reports that he was entirely cured of his prostatic trouble.

Pathological report.—Specimen, G. U. 62. The prostate has been removed in two pieces and weighs 70 grams. The right lateral lobe weighs 20 grams, and the left lateral 50 grams. The inner portion of the left lateral lobe has two large lobules separated by deep fissure, and is probably the median and anterior portion of the prostate. The consistence of the lobes is elastic and they show numerous small spheroids bound together by connective tissue. There is no induration nor euggestion of malignancy. There are no mucous membrane nor ejaculatory ducts removed.

Microscopic examination.—The hypertrophy is a moderately glandular one, the various acini being separated by fair amounts of stroma. There seems to be but slight tendency to arrangement of the acini in spheroids nor do the lumina of the acini present the same complexity of outline which one so frequently sees. There are very few intraacinous projections, and there is present very little dilatation. The stroma contains more connective tissue than muscle, but the muscle element is fairly abundant. The blood vessels show a moderate degree of arteriosclerosis. There are some areas of prostatitis present.

CASE 7.—*Moderate hypertrophy of median and lateral lobes. Catheterism. Complication—gauze pack not removed. Second operation 10 months later. Removal of gauze. Cure. Followed 38 months.*

No. 340. W. S. O., age 58, married, admitted February 26, 1903.

Complaint.—" Prostatic hypertrophy."

No history of gonorrhœa.

Present illness began eight years ago with slight difficulty of urination. In February, 1896, acute retention of urine came on and he had to be catheterized, and two months later had to be catheterized again for the same reason. Since then the patient has catheterized himself every day. In September, 1896, both epididymes became inflamed. During the past seven years, in which he has used a catheter at bed time, he has had as a rule very little discomfort with the exception of epididymitis and occasional hematuria and fever. His general health has remained good.

S. P.—The patient catheterizes himself at bed time, and during the day is able to void small amounts.

Sexual powers.—Erections are apparently normal, but sexual powers have been slightly impaired.

Examination.—The patient is a healthy looking man. Chest and abdomen negative.

Rectal examination.—The prostate is moderately hypertrophied, fairly hard, slightly irregular, but not nodular. The median furrow and notch are obliterated and the seminal vesicles are not palpable.

Urinalysis.—Cloudy, slightly acid, sp. gr. 1010, albumin in slight amount, no sugar. Microscopically, pus cells in moderate number and bacilli. Urea 9 grams per liter.

Cystoscopic examination.—A coudè catheter passes with ease and finds 140 cc. residual urine. The bladder is apparently large and of good tonicity. The cystoscope shows a moderate intravesical enlargement of both lateral lobes and a rounded median bar continuous with the left lateral lobe, but separated from the right lateral lobe by an intervening sulcus. The bladder is slightly inflamed, moderately trabeculated, with several small cellules present. The right ureter can be seen and appears normal; the left cannot be seen on account of the median bar.

Operation, March 2, 1903.—Perineal prostatectomy by the usual technique. The lateral lobes which were moderately enlarged were removed each in one piece. The median lobe was then drawn into the left lateral cavity and easily enucleated. The floor of the urethra and ejaculatory ducts were preserved and the wound was closed with double tube drainage and light gauze packs for the lateral cavities.

Convalescence.—The patient reacted well from the operation. The temperature reached 102° on the second and third days, but after that it was practically normal. The gauze packing was gradually removed, beginning on the third and completed on the sixth day. Continuous irrigation of the bladder was kept up for nine days and the tubes then removed. For one day all of the urine came through the perineal wound. A catheter was then inserted through the urethra, and maintained there for four days. After that the patient voided partly through the penis and partly through the wound. The patient was up in a wheel-chair on the twelfth day and was walking during the third week. He was discharged on the twentieth day. At that time he was voiding urine at intervals of four hours, had no inconvenience, only a small amount of urine came through the perineal fistula. The fistula finally closed one month after the operation.

May 1, 1903.—Perineal wound has been closed for a month. The patient voids urine every three or four hours, suffers no pain, and feels well. There has been no incontinence, but he has had a urethral discharge and once or twice a small amount of blood at the meatus. Partial erections have occurred.

Examination.—The perineal wound has healed. A catheter passes with ease and finds no residual urine. The bladder capacity is 300 cc. The urine contains considerable pus in the first and third glass, but the second is practically clear.

October 8, 1903.—A urethral discharge persisted during the summer, and in August he began to suffer pain in the perineum, an abscess developed and was incised in Mexico. Since then perineal fistula has never closed and there has been a considerable discharge from the meatus and from the fistula. There has also been considerable hemorrhage at times, but always with the first urine. A catheter passes with ease and shows 10 cc. residual urine, there is no stricture present. The cystoscope shows a slightly irregular prostatic margin, but no evidence of prostatic enlargement or obstruction.

January 11, 1904.—The fistula persists. Rectal examination shows a small oval mass about the size of a normal prostate in the region of the prostate. Examination causes blood to escape through the fistula. Operation upon the fistula is advised.

Operation, January 15, 1904.—Ether. The perineal fistula was excised and found to lead into the left lateral cavity of the prostate where a considerable piece of gauze forming a mass about 3 cm. in diameter was found imbedded. It was extracted without difficulty, and the cavity thoroughly curetted. The bulbous urethra was opened and a retention catheter fastened to the skin by silk sutures.

Convalescence.—The patient reacted well. The retention catheter was maintained for 19 days. At that time the posterior fistula had closed tight. Since the removal of the catheter the bulbar urethrotomy wound has healed slowly, and to-day, four weeks after the operation, all the urine passes through the meatus.

June 17, 1904.—The patient is able to retain urine for five or six hours, and urination is normal. His sexual powers have gradually improved. Erections are fairly good, but he has not attempted intercourse.

February 1, 1905.—Letter. I void urine naturally, do not get up at night and consider myself cured.

November 30, 1905.—Letter. I void urine naturally once at night and twice during the day and large amounts at a time. I have no pain, no fistula and consider myself cured. Erections are fair and sexual intercourse fairly satisfactory. My health is excellent.

May 8, 1906.—Letter. I void urine naturally, and often do not urinate at all during the night. I have no pain. I have erections and sexual intercourse, but the erections are slightly imperfect. My general health is excellent, and I consider myself cured.

Pathological report.—Specimen, G. U. 64. The specimen consists of two pieces, the median and lateral lobes and weighs 30 grams. The left lobe measures 4.5 x 3.5 x 2 cm. The right lobe 4.5 x 3 x 2 cm., the median 4 x 2.5 x 1.5 cm. No mucous membrane or ejaculatory ducts have been removed. The surface shows numerous small lobules and spheroids, and is elastic in consistency.

Microscopic examination.—The hypertrophy is of a mixed type, in some areas glandular, in others fibro-muscular. Some formation of spheroids, the spheroidal areas being glandular. The acini within these spheroids present the usual intra-acinous off-shoots, often of papillomatous type. The stroma contains a large amount of muscle, which is equal to, if not in excess of the connective tissue. The blood vessels seem about normal.

Case 8.—*Chronic prostatitis with median bar formation. Complete retention of urine. Severe cystitis and vesical irritability. Operative result, improved.*

No. 364. P. F. E., age 45, married, admitted November 4, 1902.

Complaint.—"Bladder trouble which came on after typhoid fever."

He never had gonorrhœa.

Present illness.—Two years ago the patient had typhoid fever and required catheterization. Since then the catheter has been necessary most of the time, and of late he has had to use it very frequently, generally every two hours and sometimes as often as every half hour. On admission he was using the catheter from 10 to 18 times at night, and would often experience great difficulty in introducing it. He suffered severe pain in the bladder which was markedly contracted, and has lost a great deal of weight. He has had no sexual intercourse for over two years, but has had erections frequently and nocturnal pollutions occasionally.

Examination.—The patient is a weak-looking, nervous man. Heart, lungs and abdomen are negative. A soft rubber catheter meets with an impassable obstruction 21 cm. from the meatus. A silver catheter passes with ease and withdraws 420 cc. residual urine.

Rectal examination.—The prostate is only slightly enlarged, indurated and continuous with the seminal vesicles which are also indurated and adherent to surrounding structures. Running from one seminal vesicle to the other is a connecting mass of indurated tissue. The picture is that of chronic prostatitis and seminal vesiculitis.

Cystoscopic examination.—The bladder is very irritable and appears to be contracted. The cystoscope shows a markedly inflamed, trabeculated bladder. The lateral lobes are not at all enlarged, but there is a small median bar present.

Treatment.—At first the patient was catheterized four times a day and the bladder irrigated with boric acid. Under this treatment he improved considerably, and after 53 days in the hospital he returned home able to void his urine without a catheter. Very soon the vesical irritability returned and catheterization again became necessary.

On second admission, February 2, 1903, he was using a catheter several

times a day, and was able to void only with great difficulty. The urine was acid, 1018; no sugar; albumin, a trace; microscopically, pus, epithelium. No casts.

February 22, 1903.—Cystoscopic examination. A catheter finds 250 cc. residual urine. The cystoscope shows a definite, but small, median bar, but no enlargement of the lateral lobes. The bladder is markedly trabeculated. Numerous pouches and small diverticula are seen in the region of the ureteral orifices. With the finger in the rectum and cystoscope in the urethra a definite increase in the median portion of the prostate is made out.

Operation, March 5, 1903.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were enucleated, and when removed were found to be very little enlarged. No note is made as to the median lobe, but this was apparently left behind, as it was impossible to get it to present into one of the lateral cavities. (This was one of the early operations and a different technique would now be used.) The wound was closed as usual with gauze drainage for the lateral cavities and double tube drainage for the bladder. Patient stood operation well, pulse at end 80. Continuous irrigation was kept up for 10 days.

Convalescence.—Satisfactory. The temperature did not rise above 100° and his condition was always good. The drainage tubes were removed on the tenth day, and on the sixteenth day a retained catheter was placed in the urethra in order to facilitate closure of the perineal fistula. He was discharged from hospital on May 10, his general condition being good, but a small perineal fistula was still present.

April 28, 1903.—The perineal fistula persists, and probe passes directly into the urethra. To-day the edges are freshened up with scissors.

May 5, 1903.—The perineal fistula is healed except for a small opening. During the day he is able to hold his urine for several hours, but during the night there is occasional incontinence. His general condition is excellent.

May 25, 1903.—The patient got up once last night to urinate. This morning he has held his urine for four hours. He voids urine easily without hesitation and has no dribbling. The fistula is closed. Silver catheter passes with ease and finds 25 cc. residual urine and a bladder capacity of 350 cc.

January 20, 1904.—Letter. I can hold my urine for three hours during the day, but have to arise about every 1½ hours at night. The fistula closed three months after the operation. I still suffer pain in the bladder and my urine is cloudy. I have no erections.

May 22, 1904.—Letter. I void urine about every two hours during the day and about every six hours during the night. The stream is small and the amount of urine voided about 125 cc. I have never used a catheter.

November 30, 1905.—I am greatly improved by the operation, but have more frequent urination during the night than I have during the day. I do not use a catheter. I have pain in the back. I have gained in weight. I do not have erections any more.

May 14, 1906.—Letter. The wound has remained healed and I have not used a catheter. I hold my urine very well during the day, but not very well at night. The amount voided is not regular. If I overdo myself I suffer some pain. I have no erections. My general health is only fairly good. I have gained in weight, and I am cured in some ways.

CASE 9.—*Moderate enlargement of median and lateral lobes.. Suprapubic cystostomy and three Bottini operations done previously. Perineal prostatectomy. Cure. Rectal fistula. Plastic operation to close it. Cure. Followed 22 months.*

No. 351. J. M. L., age 63, married, admitted March 11, 1903.

Complaint.—"Prostatic obstruction. Suprapubic fistula."

No history of gonorrhœa.

Present illness began six years ago with slight difficulty and increased frequency of urination. In 1898, the difficulty had increased greatly and finally complete retention of urine came on requiring catheterization. After that the catheter was used, at first every day, but after that more frequently, and after 1899 the retention of urine was complete. In October, 1902, the patient suffered great pain, tenesmus and catheterization was necessary about every hour. On October 28, 1902, the bladder was punctured with a large trocar and canula, and a small soft catheter inserted through the canula and left in the bladder for continuous drainage. On December 16, 1902, a Bottini operation was performed in an adjacent city. Two incisions were made, both lateral with a negative result. On January 11 a second Bottini operation was performed, a median incision 2½ cm. being made. Results again negative. On February 1, 1903, a third Bottini, two lateral incisions between the previous lateral and median cuts. Results negative. The suprapubic catheter drainage was maintained and the patient was unable to void urine.

S. P.—No urine is voided through the urethra, but all escapes through a small suprapubic catheter drain. The patient suffers constant pain in the bladder for which he takes morphine.

Sexual powers.—Normal; erections occurred at frequent intervals up to the time of the first Bottini operation. Since then has had no erections.

Examination.—The patient is well developed. General condition good. The chest abdomen and genitalia are negative. There is a direct reducible hernia on the left side. There is a small suprapubic sinus in which the patient wears a small catheter.

Rectal.—The prostate is moderately enlarged, rounded, elastic. At the upper end of the right lobe there is a small nodule, but the seminal vesicles are negative.

Urinalysis.—Moderately cloudy, acid, 1015, albumin in slight amount, pus cells and bacteria numerous. Total urine in 24 hours, 1260 cc. Total urea G-22.7.

Cystoscopic.—The bladder capacity is 200 cc. The cystoscope showed two fairly large intravesically hypertrophied lateral lobes connected by

a moderately large median bar without intervening sulci. Two depressions, probably cystoscopic cuts, were seen, but they were very shallow. The suprapubic catheter was seen, and its end is slightly encrusted with calcarious salts. There is no calculus in the bladder. The trigone and ureters could not be seen.

Operation, March 19, 1903.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were moderately hypertrophied and easily enucleated Along with the left lateral lobe the median bar and a portion of the right lateral lobe was enucleated in one piece without injuring the urethra or the ejaculatory ducts. The entire right lateral lobe could easily have been drawn through the suburethral cavity made by the freeing of the median lobe into the left lateral cavity and removed in one piece with the median and left lobe had the operator not been afraid of tearing the ejaculatory ducts. The wound was closed with double tube drainage and light packs for the lateral cavities. The superficial perineal muscles were approximated with three buried sutures of catgut (but apparently the levator muscles were not drawn together over the rectum). The skin wound was partially closed on each side with catgut. The patient was infused on the table. He stood the operation well, but his pulse was quite rapid, 140 at the end. Continuous irrigation on return to the ward.

Convalescence.—The suprapubic drainage was maintained. There was practically no rise of temperature and the patient convalesced well. On the night after the operation an assistant, thinking the hemorrhage was too profuse, packed a considerable additional amount of gauze into the perineal wound, and none of this was removed until the sixth day when the perineal tubes and most of the gauze were extracted. Nine days after the operation all of the stitches were removed on account of suppuration, and the wound irrigated and repacked. On the eleventh day a catheter was placed in the suprapubic sinus for drainage. The patient then complained of gas escaping through the perineal wound for the first time. Two weeks after the operation a definite rectal fistula was discovered. The perineal urinary fistula closed about 30 days after the operation, and the patient was discharged from the hospital May 24, 66 days after the operation. At that time there was no leakage of urine through the perineum or into the rectum, and the suprapubic fistula had closed. There was a very fine perineal-rectal fistula present through which a small amount of gas occasionally escaped. His general health was excellent. He was able to retain urine for two and one-half hours, but still suffered pain. A catheter passed easily and showed no residual urine. Bladder capacity was 400 cc.

October 26, 1903.—The patient reports that the communication between the perineum and the rectum has never closed. In July, after a forcible urethral irrigation, urine began to escape during micturition through the perineal fistula. Since then gas has occasionally escaped through the urethra, but never any feces. Urination is satisfactory, at intervals of six hours at night and three to four hours in the day.

Examination.—A small perineal fistula is present, through which a fine

probe can be passed into the rectum, the rectal opening being about 3 cm. above the anus. No urine escapes into the rectum and only a few drops through the perineal fistula.

Operation, October 27, 1903.—Ether. Closure of rectal and urethral perineal fistula. An inverted V perineal incision was made in the site of the old scar and the fistulous tract excised. Urethrotomy of the anterior portion of the bulbous urethra was then performed and the tractor inserted. The opening into the urethra was then sutured with several layers of catgut, and after that the rectum was closed with several layers of interrupted catgut. The skin wound was partially closed and lightly packed with gauze and a permanent perineal drainage tube.

Convalescence.—The patient reacted well. The perineal drainage tube was removed after eight days, after that urine was voided freely through the incision for several days, but there was never any leakage of the sutured urethral wound. The rectal wound broke down on the seventh day and gas and feces escaped through the perineum for about a week, and he thinks a small amount of gas escaped through the meatus. Since the 14th day the rectal wound has remained closed, and the perineal wound has healed. The bulbar urethrotomy wound has been closed since the 21st day.

December 20, 1903.—Examination. The patient voids urine at intervals of three and one-half hours, occasionally six hours. Both wounds in the perineum are solidly healed and the rectal fistula is closed. The silver catheter passes easily and finds 10 cc. residual urine. The urine is acid, cloudy, contains pus cells and bacilli in large number.

May 20, 1904.—Letter. The wounds have remained healed, and I void urine at intervals of five or six hours at night and three or four hours in the day, about one-half pint at a time. I have a slight pain in the urethra. I have had no erections.

February 1, 1905.—Letter. I void urine naturally at intervals of one to two hours during the day and two to three at night. The amount voided each time is abundant. I suffer some pain during urination. I have not had erections. My general health is very good.

The patient died March 31, 1905. Cause of death not stated.

Pathological report.—The specimen G. U. 271, consists of one piece which represents the left lobe of the prostate, median bar and a portion of the right lobe, and weighs in all about G-10. The portion forming the left lateral lobe is a globular mass about 3 x 2.5 x 2 cm. in size. The median portion is about 2 cm. thick. Only a small portion of the right lateral lobe has been removed, being a mass about 2 cm. in diameter and .5 cm. thick. On section there is a moderate amount of stroma, and considerable dilatation of the acini. No mucous membrane, no ducts removed.

Microscopic examination.—The hypertrophy is a glandular one with moderate dilatation of the acini. The acini show a rather unusually large number of intraacinous projections, often papillomatous in type. These intraacinous off-shoots are often formed of pure epithelium, the stroma as yet not having grown into them. It would seem that the epithelial activity

was unusually marked within the acini. The stroma contains a large amount of muscle, in many areas being considerably in excess of the connective tissue. Some embryonic tissue formation is seen. The blood vessels for the most part are normal, but here and there there is present a moderate degree of arteriosclerosis.

CASE 10.—*Small sclerotic prostate. Pain and great irritation. Contracted bladder. Cured of obstruction. Slight contraction remains. Followed three years.*

No. 398. E. J. H., age 62, admitted May 1, 1903.

Complaint.—"Frequency of urination."

Gonorrhœa at the age of 28, a light attack lasting only three days. Present illness began about seven years ago with frequency of urination and burning in the urethra and slight difficulty. After that intermittent attacks of irritation and frequency every few weeks. For the past five years has had a continuous pain in the bladder with difficulty and frequency of urination. He had complete retention of urination in January, 1903, four months ago and required catheterization twice.

S. P.—The patient urinates five times during the night and about as often during the day. During urination he has a burning pain in the urethra, but the stream is small and slow. He has suffered so severely that he has been unable to attend to business. His sexual powers were good until six years ago, since then ejaculation has been extremely painful, and he has ceased having coitus. Nocturnal emissions cause a burning which he says is like a coal of fire. His general health is rather poor; he is extremely nervous.

Examination.—The patient is fairly well nourished, but extremely neurotic in appearance. The chest and abdomen are negative.

Rectal.—The prostate is moderately enlarged. The right lobe is smooth, but quite hard. The left lateral lobe is smaller than the right, its surface is a little irregular, two or three nodules being present, and is quite indurated. The seminal vesicles, however, cannot be palpated and are evidently soft.

Cystoscopic.—A coudè catheter passes easily and finds 100 cc. residual urine. The bladder is considerably smaller than normal. The cystoscope shows prostatic enlargement in the shape of a collar around the orifice. The lateral lobes are definitely hypertrophied with a definite sulcus between them in front. The median bar is slight, and there were no sulci between it and the lateral lobes. The ureters and much of the trigone could be seen behind the bar. The bladder is considerably trabeculated, no cystitis, no calculus. With finger in rectum and cystoscope in urethra the beak could be felt, and there is a moderate increase in the median portion of the prostate and a considerable increase in the urethtral length.

Urinalysis.—Clear with a few shreds in the first glass which under the microscope are found to be pus cells. The urine is neutral, 1010, slight trace of albumin, Urea G-8 to the liter. Microscopically negative.

Operation, May 18, 1903.—Ether. Perineal prostatectomy by the usual

technique. The lateral lobes were only moderately hypertrophied, were quite adherent and removed with some difficulty, but each came away in one piece without tearing the urethra or bladder, and measured 5½ x 3½ x 3 cm. Examination of the median portion showed that it was only slightly larger than normal, and it was thought unnecessary to remove this. The wound was closed as usual with double tube drainage, light packs for the lateral cavities, and continuous irrigation on return to the ward. The patient stood the operation well. The pulse at the end was 104.

Convalescence.—The patient reacted well. The highest temperature was 101.2 on the day after the operation. He had some fever for the four succeedings days, and after that the temperature was practically normal. The irrigation was continued for four days when the tubes were removed, and the gauze was removed on the third day. Interval urination was established early, and on the eighth day two-thirds of the urine came through the anterior urethra. The perineal fistula closed on the 14th day and the patient left for home on the 19th day. Urination was almost normal, no incontinence, and condition excellent.

November 3, 1903.—I suffered for a time with irritability of the bladder, but have improved, and can now retain urine for three or four hours and have no incontinence.

November 28, 1903.—I retain urine for four or five hours during the day. At night I sometimes urinate every hour and always after having drank a good deal of water.

May 20, 1904.—I void urine about every four hours during the day, more frequently at night, about six ounces at a time, do not use a catheter. Urination is satisfactory. I have no erections.

January 15, 1905.—I void urine normally and have no pain, about six times in the day and six times at night, about six ounces at a time. I have no erections.

November 30, 1905.—The wound is closed. I void four or five times during the day and about the same number of times at night, but I drink a large amount of lithia water. I have never used a catheter since the operation and consider myself cured. I have no erections. My health is good.

Case 11.—*Very large hypertrophy of the two lateral lobes. No median lobe enlargement. Complete retention of urine for 10 days. Catheter withdrew 4500 cc. urine. Bottini operation. Relief of obstruction. Fifteen months later severe hemorrhages. Perineal prostatectomy. Cure. Followed three years.*

No. 173.—W. F. S., age 55, single, admitted January 10, 1902.

Complaint.—"Complete retention of urine."

The patient had gonorrhœa twice in his youth, but no stricture developed. Present illness began five years ago with slight difficulty in urination and since then his condition has gradually grown worse, urination gradually becoming more frequent and difficult. Three months ago large clots of blood passed with the urine. On January 1, 1902, he was suddenly

seized with pain in the bladder and was unable to void urine. His physician was able to withdraw only a small amount of urine with the catheter. A chill followed by fever, nausea and vomiting came on, and although he was able to void but little urine he was not catheterized again until January 10. He was then seen by Dr. Pancoast, who found the abdomen greatly distended, and the bladder palpable three fingers' breadths above the umbilicus. A catheter was introduced with difficulty and 4500 cc. of cloudy urine withdrawn. The patient was then sent to the Johns Hopkins Hospital, where the following notes were made. "The patient is fairly nourished and mentally clear. His tongue is dry and red, his pulse of good volume and tension regular, the vessel wall considerably sclerosed. Very fine râles are present at the bases of both lungs, a slight systolic murmur is present at the apex of the heart and the second aortic is accentuated. The lower abdomen is full (17 hours after catheterization by Dr. P.). The bladder dullness extends two fingers' breadths above the umbilicus. A catheter passes with ease and 2800 cc. of urine is withdrawn. Catheter is fixed in the bladder for permanent drainage."

January 16, 1902.—The patient has improved, but still has a slight temperature, but the urine contains pus, and the bladder is irrigated twice daily.

February 1, 1902.—The bladder has been drained by permanent catheter for three weeks, and the patient's condition is excellent. The prostate is considerably enlarged in both lateral lobes, consistence soft, elastic, smooth, seminal vesicles not indurated.

Cystoscopic examination.—Although the patient has had continuous catheterization for three weeks, the bladder capacity is very large and the tonicity very poor. The cystoscope shows two large intravesically hypertrophied lateral lobes, the bladder wall is only moderately trabeculated, and no diverticula are present.

Urine.—On admission the analysis showed sp. gr. 1010, reaction acid, no sugar, trace of albumin, a sediment tinged with blood, and microscopically, pus, red blood corpuscles, hyaline and coarsely granular casts. A daily urine chart was kept and the amount of urine was always large, varying from 2160 cc. to 4370 cc. on January 17. Sp. gr. was generally about 1010, and the total urea varied from 15 to 28 grams in 24 hours. Hyaline and granular casts were constantly present.

March 15, 1902.—During the past six weeks the patient has been catheterized five times a day. He is unable to void urine, and produces from 1600 to 2300 cc. urine daily. The urine is still purulent and still contains hyaline casts, no granular casts seen. His general condition is excellent.

March 16, 1902.—Operation. 4% cocaine in the urethra. Bottini operation. Three cuts, one posterior, 2.8 cm. long, two lateral with blade No. 3, each 3 cm. long. There was very little hemorrhage and the patient suffered no pain.

Convalescence.—Immediately following the operation the patient began to dribble urine. A catheter was passed during the evening and 700 cc. urine withdrawn.

March 17, 1902.—The patient has been voiding all day, a catheter finds 600 cc. residual urine. There has been no chill or fever following the operation. The patient was out of bed on the third day, and he was discharged on the 12th day, in excellent condition.

June 21, 1902.—The patient is in excellent condition. Voids urine two or three times in the day and once at night, about 500 cc. at a time. The urine is cloudy, acid, sp. gr. 1018, and albumin, pus cells and bacilli are present.

July 19, 1902.—The patient voids a good stream and does not get up at night.

April 14, 1903.—About 10 days ago the patient began to have hematuria, the hemorrhage was very severe and lasted for several days. The urine is now free from blood. A catheter passes with ease and finds only 16 cc. residual urine. The bladder capacity is large and the tonicity is good. The cystoscope shows two very large intravesically hypertrophied lateral lobes with only a small fold of mucous membrane joining them in the median portion. It was impossible to find the point from which the bleeding came. As the patient is otherwise normal, and often does not get up at all at night to urinate, no operation is advised.

May 15, 1903.—The patient has had another severe hemorrhage in the bladder, and an injection of adrenalin is required this morning to stop it.

May 16, 1903.—The urine is again clear. General condition is excellent. Voids urine in a large stream four or five times a day, and has apparently a perfect result from the Bottini operation with the exception that when he has intercourse no semen appears at the meatus, although the act is otherwise normal. He is advised to have perineal prostatectomy in order to remove the tremendous prostate and relieve him of the dangerous hemorrhages. Rectal examination shows the prostate to be very large, smooth and soft. The lungs are negative. There is a systolic murmur at the apex of the heart.

Operation, May 25, 1903.—Ether. Perineal prostatectomy by the usual technique. Each lateral lobe which was very large was removed in three large pieces, this was necessary because the blade of the tractor would not remain on top of the very large intravesical lobes, but constantly slipped beneath them so that when one large lobule was removed on each side it was necessary to again place the tractor upon the summit of the remaining intravesical mass, draw it down and enucleate again. In this way it was very easy to remove completely a very large, probably pedunculated median lobe on each side. The urethra and ejaculatory ducts were preserved intact, but two small tears were made in the vesical mucosa, none of which was removed. The median portion of the prostate was not disturbed. The wound was closed as usual with double catheter drainage and light gauze packs for the cavities. Patient stood the operation well. Infusion and continuous irrigation. Pulse at end of operation 80.

Convalescence.—The highest temperature was on the fifth day after the operation, 100.8°; after that it was practically normal until June 15, when

it suddenly arose to 103.5°, but quickly fell to normal. The continuous irrigation was kept up for nine days when the tubes and gauze were removed. There was incontinence for three or four days, but after that control was established and he could retain urine for five hours. The urine did not pass through the urethra until the 12th day, and the fistula closed on July 6, the 42d day. On June 6 a retained catheter was placed in the urethra and remained for three days. Following the patient had a rise of temperature and developed epididymitis which continued for a week, but subsided without operation. On July 3 the patient had another sudden rise of temperature to 102°, but it subsided at once and the patient left the hospital July 19 in excellent condition, able to retain urine all night and voiding only three or four times in the day.

January 14, 1904.—Urination is normal and at intervals of five hours in the day and seven hours at night, no incontinence. Sexual powers are good. After ejaculation the semen is now thrown cut of the meatus (after Bottini it was not). Examination of the semen caught in a condom shows numerous spermatozoa.

February 1, 1905.—I urinate at normal intervals and am entirely cured. My sexual powers are normal.

November 13, 1905.—I void urine naturally, once at night, three or four times during the day, a half a pint or more at a time. I have no fistula, no pain. Intercourse is entirely satisfactory, and my general health good.

May 8, 1906.—Letter. I void urine naturally three or four times during the day, and twice at night, a half pint or more at a time. I have no pain. Sexual intercourse is entirely satisfactory. My general health is excellent, and I consider myself cured.

Case 12.—*Slight hypertrophy of the lateral lobes. Small pedunculated median lobe. Post operative complication: gauze left in wound. Pin point fistula. Cure. Followed three years.*

No. 408. J. R., age 70, married, admitted May 26, 1903.

Complaint.—" Difficuty in urination."

No history of gonorrhœa.

Present illness began nine years ago with difficulty of urination. At the end of four years he began to have pain during urination located about the middle of the urethra. In February, 1902, he was catheterized and a quart of residual urine obtained. Since then he has used a catheter off and on, although he has never had a complete retention of urine.

S. P.—He voids urine five or six times during the night, micturition being difficult and painful. If he uses the catheter he is able to go four hours without urinating. During the last six months he has lost very little weight, and his general condition is good. Sexual powers have diminished. Erections only occasionally and desire for intercourse practically lost.

Examination.—The patient is a fairly strong looking man, lips of good color. Heart, lungs and abdomen negative.

Rectal examination.—The prostate is slightly but symmetrically enlarged. It is firm in consistence, but is not markedly indurated and has no nodules.

Cystoscopic examination.—A coudè catheter passes with ease and finds 480 cc. residual urine. The vesical tonicity is good. The cystoscope shows a small sessile rounded median lobe with a deep sulcus on either side. A chronic cystitis is present, but no calculus. Prostatic secretion contains pus cells, a few lecithin and granule cells, no spermatozoa.

Urinalysis.—Acid, sp. gr. 1018, no albumin in filtered specimen, no sugar. Urea G-19 per liter. Microscopically, pus cells, bacilli and cocci, no casts. Total urine voided in 24 hours 1750 cc.

Operation, May 29, 1903.—Ether. Perineal prostatectomy by the usual technique. The right lateral lobe was not at all enlarged, was quite fibrous and came away in small pieces. The left lateral lobe came away in one piece measuring 4 x 2½ x 2 cm. The median lobe was removed through the left lateral cavity without tearing the mucous membrane of the urethra or bladder and leaving the ejaculatory ducts intact. A specimen removed is shown in the photograph (see Fig. 25a) which is actual size. The wound was closed as usual with double tube drainage, lateral cavities being packed with gauze.

Convalescence.—Patient reacted well. Continuous irrigation was kept up four days. The packing was removed during the first week, and the tubes on the tenth day. The wound broke down and healed slowly by granulation. After removal of the tubes there was incontinence of urine which persisted until the patient was discharged. Several weeks after the operation as the fistula did not heal, during my absence in Europe, a catheter was placed in the urethra and kept there for eight days. Examination at the end of that time showed that a piece of the packing had been left in the wound, and after its removal healing proceeded rapidly. He was discharged on August 6, 1903. A small urinary fistula was present, and the patient was able to retain his urine for several hours. His general condition was excellent and he was free from pain.

January 20, 1904.—Letter. The fistula is not yet closed, but I void urine in a large stream through the urethra at intervals of from three to five hours. I have no pain, have erections occasionally.

April 22, 1904.—I have perfect control of my urine, but a pin point fistula is present. I can retain urine for five hours.

February 1, 1905.—I void naturally at intervals of from three to six hours. A pin point fistula persists, but I have no pain and feel well.

November 30, 1905.—Letter. I void urine naturally once at night and about three times during the day. Have no pain. A pin point fistula persists, but often there is no leakage and at other times only a few drops. I feel perfectly comfortable, my general health is excellent and I have gained 40 pounds in weight. I have erections occasionally.

May 7, 1905.—Letter. I void urine naturally, once at night and three times during the day, large amounts at a time. I have no pain, no erections. My general health is excellent and I consider myself cured.

Pathological report.—The specimen, Path. 35, consists of three lobes weighing G-17. The median lobe weighs G-7, and measures 3 x 2 x 2 cm. The left lateral lobe is about the same size. The right lobe is composed of several small pieces and weighs much less than the median. On section there is a thin capsule surrounding the lobe, and the typical adenoma with numerous dilated acini.

Microscopic study shows the typical spheroidal arrangement with capsules containing compressed acini. There are many dilated acini with compressed epithelium of a columnar type. The stroma is composed of fibrous tissue and smooth muscle loosely bound together with very few areas of interstitial inflammatory deposits. The epithelium is well preserved, no glandular prostatitis present. Corpora amylacea fairly numerous.

Case 13.—*Very large hypertrophy of median and lateral lobes. Old suprapubic fistula. Contracted bladder. Cure. Followed three years.*

No. 518. G. G. H., age 74, married, admitted May 28, 1903.

Complaint.—"Enlarged prostate. Suprapubic fistula."

Gonorrhœa in 1850, light attack, no complications.

Present illness began eight years ago with difficulty, pain and frequency of urination. Progress of the disease was gradual until June 11, 1902, when retention of urine became complete and his physician was unable to pass a catheter and performed suprapubic cystotomy. Since then he has worn a suprapubic drainage apparatus.

S. P.—The patient wears a suprapubic apparatus, no urine comes through the urethra, there is considerable leakage around the tube, he suffers pain and is uncomfortable.

Sexual powers.—He has erections occasionally, but has not had intercourse for a year. His general health is good.

Examination.—The patient is a robust man, lips of good color, arteries slightly thickened, pulse 82. The chest and abdomen are negative. There is a large suprapubic fistula in which the patient wears a tube connected with a Bloodgood bag. Examination of the bladder through the fistula with the finger shows a very large collar-shaped hypertrophy of the lateral and median lobes which stands up three and one-half inches above the trigone into the bladder, the upper limits reaching to within 1 cm. of the suprapubic opening.

Rectal.—The prostate is greatly hypertrophied, the right lobe being the larger, and having a peculiar lobule projecting from its lateral border. The prostate is smooth, elastic, the notch and furrow are obliterated. The seminal vesicles cannot be reached.

Cystoscopic.—The cystoscope was introduced through the suprapubic opening. The intravesical prostatic enlargement consisted of a huge middle lobe which coalesced without intervening sulci with two large lateral lobes, between which there was a deep sulcus in front. The ureters lay beneath the median lobe and could not be seen. An attempt was then made to cystoscope the bladder through the urethra, but the intravesical

portion was so great that the instrument could not be passed over the top of it. The finger in the suprapubic wound showed that the end of the cystoscope lay in the space in front of the median lobe.

Operation, May 30, 1903.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes, which were very large, were removed each in three large lobules. The median lobe was delivered into the left lateral cavity and enucleated with ease, without removing any of the mucous



FIG. 41.—Large lateral and median lobes. Exact size.

membrane which covered it. This lobe was 5 cm. long, 3½ cm. wide, and 2½ cm. thick. The accompanying photograph shows the lobes in their relative position (Fig. 41). The urethra and ejaculatory ducts were preserved intact. At the end of the operation a finger was inserted in the suprapubic fistula and showed no intravesical prostatic enlargement, the mucous membrane covering the same having contracted down so that the vesical neck felt almost normal in smoothness. The perineal wound was

closed as usual with double catheter drain, and light packs for the lateral cavities. Infusion and continuous irrigation. The condition of the patient at end of operation was good.

Convalescence.—The patient reacted well. His highest temperature was 101°, and there was very little hemorrhage. The gauze was not removed from the perineal wound until four weeks after the operation (the operator was away on vacation), and the suprapubic tube in six weeks. At that time the perineal wound was entirely closed. He left the hospital on the 55th day, his condition was excellent. Six days later an abscess developed in the perineal wound, was opened by his physician and a silk ligature removed. After that the perineal fistula healed promptly, and urination soon improved.

January 23, 1904.—Urination is easy but painful, and occurs at intervals of one or two hours night and day Both wounds are healed. I never use a catheter. An abscess developed in the perineum shortly after my return home, but after the removal of a silk stitch the fistula healed. I suffer all the time with a pain in the neck of my bladder and penis. My general health is good.

May 20, 1904.—" Urination is free but painful. I void urine at intervals of two hours during the day and three or four at night. I do not have erections." The patient was directed to have bladder examined for calculus. If his bladder was found to be contracted, to use hydraulic dilatation.

February 1, 1905.—I urinate about every three hours during the day and four or five hours during the night, one-half pint at a time. Micturition is natural, but I still suffer pain in the penis which is worse during urination.

November 30, 1905.—Last August I went to Eureka Springs and drank large quantities of the water there. My bladder became three times as large as before and the pain disappeared. I now feel better than I have for six years, in fact, I am entirely cured. Can retain urine five hours during the day and nine hours at night, and sometimes void a pint at a time. I have no pain. I do not have erections.

May 8, 1906.—Letter. The wound has remained closed. I am cured. I void urine naturally as much as I ever did and often pass over a pint at a time. I have no pain. I do not have erections nor sexual intercourse. My general health is excellent.

Pathological report.—Specimen, G. U. 44, consists of the lateral and median portions of the prostate removed in six pieces and weighs about G-80. The left lateral lobe has been removed in one piece measuring 4 x 3.5 x 2.5 cm., is globular in shape, encapsulated and on section shows large spheroids with a moderate amount of stroma and considerable dilatation of the ducts. The right lateral lobe has been removed in two pieces which measure together 5 x 3.5 x 2.5 cm., and is similar to the left, except that the ducts are more dilated. The median portion of the prostate has been removed in three pieces, forming together a mass 5 cm. long and 6 cm. wide

as shown in photograph. It is smooth and on section shows more gland tissue and less stroma in the lateral lobes. No mucous membrane, no ejaculatory ducts, no calculus.

Microscopic examination.—The hypertrophy is a glandular one, with the acini arranged in lobules, and there is marked cystic dilatation. The majority of the dilated acini are lined by flattened epithelium, sometimes one layer and sometimes two layers thick. In areas there is considerable prostatitis present with endoglandular proliferation and desquamation and considerable periacinous formation of fibrous tissue. The stroma has a considerable excess of fibrous tissue over muscle, and there is a fair amount of inflammatory infiltration. The arteries for the most part apparently show no thickening, although here and there one sees a vessel whose walls are somewhat thickened.

Case 14.—*Slight enlargement of median and lateral lobes. Residuum 50 cc. Capacity 150 cc. Result: Cure of obstruction. Frequent urination due to vesical contracture. Followed two years.*

No. 458. J. M., age 57, married. Seen at request of Dr. Casper in Berlin, Germany, July 23, 1903.

No history of gonorrhœa.

Present illness began seven months ago with sudden complete retention of urine. He was catheterized and one and one-half liters of urine withdrawn. Immediately afterwards he had a convulsion and for four days was comatose and was expected to die. He finally rallied and left the hospital February 27; micturition very frequent, generally every hour during the day and night. He consulted Dr. Casper on March 13, 1903, and was treated by intravesical irrigations through a catheter with considerable improvement. He returned, however, in July, complaining of frequent urination, great difficulty, pain and spasm in the bladder.

S. P.—The patient voids urine every hour with a great deal of difficulty and pain. Sexual powers: No note made.

Examination.—The patient is a sturdy-looking man, with lips of good color. Heart, lungs and abdomen: No note made.

Rectal examination.—The prostate is slightly hypertrophied, smooth, hard, but not of stony hardness, no nodules, no induration in the region of the seminal vesicles.

Cystoscopic examination.—A catheter passes with ease and finds 150 cc. residual urine (later examination residual urine 50 cc., bladder capacity 140 cc.). The bladder is small and irritable. The cystoscope shows moderate intravesical hypertrophy of both lateral lobes and a small media lobe with a shallow sulcus on each side. With finger in rectum and cystoscope in urethra there is only a slight increase in the median portion. The urine contains considerable pus.

Operation, July 24, 1903.—Ether. Perineal prostatectomy by the usual technique with the kind assistance of Dr. Casper. The lateral lobes were only slightly hypertrophied and were removed each in one piece. The median portion of the prostate was small and removed through the left

lateral cavity without tearing the urethra, bladder or ejaculatory ducts. Double tube drainage, light packs for the cavities and the usual closure. The patient stood the operation well.

Convalescence.—The temperature did not rise above 38° C. and the pulse ranged between 70 and 75. On July 30 the patient began to have pain in the wound and his bowels were moved for the first time. The catheters were removed on the eighth day.

August 13, 1903.—The patient is now walking about, his health is excellent. Urine passes through the urethra. Hydraulic dilatation of the contracted bladder is to be begun.

July 13, 1904.—Letter from Dr. Casper. The patient is in good health, urination is satisfactory and the stream large. He suffers no pain, voids urine three or four times during the night and about every two hours during the day, 100 cc. at a time. He has not used a catheter. A fistula continued for a long time, then closed, but recently has opened again, but only a few drops of urine escape through it. The patient has erections about every 10 days, but has not attempted intercourse.

CASE 15.—*Considerable enlargement of lateral lobes. Slight median bar. Catheter life two years. Cure. Followed 32 months.*

No. 477. T. C. W., age 67, married, admitted September 5, 1903.

Complaint.—"Retention of urine."

No note as to gonorrhœa.

Present illness began three years ago with slight difficulty at the beginning of urination. There was a gradual increase in the trouble and two years ago complete retention of urine came on. Since then the patient has been catheterizing himself about three times every day. For the first few months of catheter life the patient had considerable hematuria, but since then the urine has been free from blood. Erections and sexual powers are normal.

Examination.—The patient is a well nourished man with lips of good color. Heart, lungs and abdomen negative. Genitalia negative. No hernia present. There is considerable arteriosclerosis.

Rectal examination.—The prostate is considerably enlarged in both lateral lobes, the left of which is the larger and more prominent. The upper end of the prostate cannot be passed.

Cystoscopic examination.—A coudè catheter passes with ease and finds 115 cc. urine. (Retention of urine is complete, this does not represent the residual.) The bladder capacity is 340 cc. The tonicity is good. The cystoscope shows considerable intravesical hypertrophy of both lateral lobes joined by considerable median bar. The bladder is trabeculated and inflamed, there is no stone present. With the finger in the rectum and cystoscope in the urethra the beak can be felt and the thickness of the median bar is moderately increased.

Urinalysis.—Pale, 1015, acid, no sugar, considerable albumin, pus and epithelium. Urea, G-14 to liter.

September 11, 1903.—Operation. Ether. Perineal prostatectomy by the usual technique with the exception that the prostatic tractor was introduced through a urethrotomy wound in the bulbous urethra before the inverted V incision or the prostatic enucleation was made. Difficulty was encountered in getting the tractor through the urethra into the bladder, and when the prostate was exposed through the usual technique it was found that the tractor drew the prostate, not into the wound, as usual, but up against the triangular ligament. The exposure was not so good and the manipulation of the tractor was more difficult. The left lateral lobe was quite large and removed in one piece about the size of a hen's egg. The right lobe was smaller and came away in two pieces. Examination seemed to show no remaining median bar and nothing was removed from this region. A small tear was made in the lateral wall of the urethra, but no mucous membrane was removed, and the ejaculatory ducts were preserved intact. The lateral cavities were packed with gauze, a soft rubber catheter was introduced into the bladder through the urethrotomy wound in the bulbous urethra and both cutaneous wonds were partially closed with interrupted sutures. An infusion of salt solution was given on return to the ward and continous irrigation of the bladder was kept up for four days.

Convalescence.—The patient reacted well, and suffered slight pain in the bladder while the catheter remained. The highest temperature was 101.2° on the day after the operation. The gauze and tubes were all removed on the eighth day, and on the tenth day a catheter was introduced through the penis into the bladder. The catheter was finally removed during the third week, but the fistula did not heal until one month after the operation, and a nocturnal incontinence persisted for five weeks. During the fifth week epididymitis came on, but subsided in four days. The right epididymitis was alone involved.

October 17, 1903.—A silver catheter passes with ease and finds 15 cc. residual urine. The bladder capacity is 400 cc. The fistula is closed and the patient has complete control. The patient can hold his urine several hours. The urine is acid, sp. gr. 1015, contains considerable albumin, pus cells and bacteria.

October 19, 1903.—The patient is discharged. Conditions excellent.

Letter. Urination is easy and satisfactory, and I can hold my urine four hours in the day and only get up twice at night. The fistula closed on the 21st day. I have not used a catheter, have suffered no pain. Erections have returned, and I have had intercourse about once in two weeks.

May 20, 1904.—I can hold urine for five hours and pass about 200 cc. at a time. Urination is normal, I have no pain, and my sexual powers have returned.

February 1, 1905.—I void naturally and consider myself cured, only having to arise once at night to urinate. My sexual powers are the same as before operation.

November 30, 1905.—I void naturally and consider myself cured, as I

only have to urinate once during the night and three or four times during the day. Sexual intercourse is the same as before operation. My general health is excellent.

May 29, 1906.—Letter. I void urine naturally four or five times during the day and only once at night, about half a pint at a time. I have no pain. I have intercourse the same as before operation, but the penis does not get so hard. My general health is good, I have gained in weight, the wound has remained closed, and I consider myself cured.

Pathological report.—The specimen, G. U. 30, consists of three pieces, the left lateral lobe is in one piece and measures about 4 x 3 x 2 cm. in size. The right lobe is in two pieces and is smaller than the left. Both lobes present the usual character of adenomatous hypertrophy.

Microscopic examination.—The hypertrophy is a lobulated glandular one. The acini are for the most part dilated, and in certain lobules have undergone cystic degeneration. In some areas the acini have very little supporting stroma, their orifices are serrated, and there is at times much intraacinous papillomatous proliferation. The epithelial cell is of a tall cylindrical type, the lumen end being rather granular and degenerated. At times there is only one layer of these tall cells, but often in many points of the acini the epithelium may be several layers thick, the deeper layers being rather cuboidal in type. Glandular proliferation within many of the lobules seems very active. The stroma contains a fair amount of muscle, but the connective tissue predominates. There are some few areas of prostatitis, but these are not noted in areas where proliferation is active. The arteries show moderate degree of arteriosclerosis.

CASE 16.[10]—*Huge intravesical hypertrophy of median and lateral lobes in man aged 82. Removal of 240 grams of prostatic tissue. Cured.*

No. 541. J. A. K., age 82, single, admitted October 17, 1903.

Complaint.—" Prostatic obstruction. Suprapubic fistula."

No history of gonorrhœa.

Present illness began 24 years ago with difficulty of urination, accompanied by hematuria and pyuria. His condition improved on treatment by hydrotherapy, but he continued to have trouble, and in 1887 had complete retention of urine for the first time and was catheterized once. After that he used a catheter occasionally on advice of his physician. In April, 1902, catheterization was impossible and a suprapubic cystotomy was performed in Washington. Since then the patient has been wearing a rubber catheter in the suprapubic wound, and all of the urine has come through this. He is unable to keep dry, is uncomfortable and suffers pain.

Sexual powers.—No note made.

Examination.—The patient is a fairly strong man for 82 years. His lips are of good color. The heart and lungs are negative.

Abdomen.—There is a small suprapubic urinary fistula in which the patient is wearing a soft rubber catheter.

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[10] Case No. 56 should have been placed here as Case 16. To change the position now (in proof) seems inadvisable.

Rectal.—The prostate is greatly hypertrophied, presenting a broad flat mass, the upper limits of which cannot be reached. It does not bulge greatly into the rectum, but it extends far upward into the bladder, and with a hand above the symphysis pubic it presents as a large intravesical mass about the size of a large orange which is easily palpable, especially on bimanual palpation with finger in rectum and hand on abdomen, when the immense size of the prostate is easily made out. Rectally its surface is smooth, soft and not tender. The seminal vesicles cannot be palpated.

Cystoscopy.—A small silver catheter is passed with great difficulty, owing to the immense size of the intravesical portion of the prostate. Urine escapes after the catheter has entered for a distance of 15 inches. An attempt was made to perform cystoscopy through the suprapubic opening, but although it was easy to introduce the cystoscope through the suprapubic sinus, the beak entered at once into the cavity in front of the median portion of the prostate which projects far up into the bladder, almost completely filling its cavity and rendering it almost impossible to introduce the cystoscope into the bladder behind the middle lobe.

Urinalysis.—Acid, 1020, albumin a heavy trace. Urea G-17 to liter. Pus cells numerous.

Operation, October 20, 1903.—Spinal anesthesia with one-fifth of a grain of cocaine. Perineal prostatectomy. The prostate was easily exposed through an inverted V incision. The urethra was opened as usual, and the tractor inserted. The posterior surface of the prostate was so immense that it could not be drawn down between the ischio-pubic rami, and the blades of the tractor were so short that they would not take hold upon the very great intravesical lobes. The prostate was therefore removed in large lobules piecemeal. The operator attempted to make pressure upon the abdomen and thus push down the prostate, but the patient could not stand the abdominal pressure which gave pain, although operation upon the prostate was painless. No attempt was made to preserve the urethra or ejaculatory ducts, and considerable mucous membrane was removed. The right lateral lobe and median lobe were completely removed, but the deeper intravesical portions of the left lateral lobe had not been completely removed when the patient became so weak that the operator decided to stop and close the wound, nevertheless 240 grams of prostatic tissue were removed. The immense cavity was packed with gauze, a large rubber tube was placed in the bladder through the perineal wound and a catheter into the suprapubic sinus. There was only a moderate amount of hemorrhage. Pulse at the beginning of the operation was 80, and at the end 68 but weak. Submammary infusion was given during the operation. The anesthesia in the region of the perineum and prostate was excellent, but suprapubic pressure caused pain. The patient vomited frequently during the operation and was distinctly shocked at the end.

Convalescence.—After injections of strychnia and water the patient reacted well and drank large amounts of water and ate a fairly good supper, For one week he had a temperature between 101° and 102°, and at times was slightly irrational. He was infused on the fourth day. On the ninth

day a large sloughing lobule of prostatic tissue measuring about 8 x 5 x 4 cm. in size was found in the perineal wound and withdrawn. Several days later a second lobule was removed in the same way. These were apparently portions of the left lateral lobe which had been loosened by the operator, but had not been removed on account of the condition of the patient. The perineal fistula being still open five weeks after the operation, a retained catheter was placed in the bladder through the urethra. This catheter was left in place for several days, and the perineal fistula promptly healed (38th day). After that the patient passed urine through the penis in small amounts, but the suprapubic sinus which was lined with epithelium, although reduced to a pin point opening refused to heal. He left the hospital eight weeks after the operation, 55th day, in excellent condition.

January 14, 1904.—The suprapubic fistula is leaking slightly, at night I urinate two or three times through the urethra; if I let too long a time elapse there is some involuntary discharge, showing a lack of force of contracture at the neck of the bladder.

January 20, 1904.—A pin point suprapubic fistula persists. The patient is advised to have this excised.

February 3, 1904.—Operation. Cocaine. Excision of muco-cutaneous suprapubic urinary fistula. The fistulous tract was very fibrous, and was excised in one piece. As the dissection proceeded, it was possible by making traction upon the fibrous tube to draw the bladder in the shape of a cone up into the skin wound where a circular suture of catgut was placed in the bladder muscle around the base of the fistulous tract which was then divided. The purse string suture was then drawn tight, thus effectually turning in and closing the vesical wound. By means of this technique it was possible to effectually suture the bladder through a very small skin incision. The muscle and subcutaneous tissue were drawn together with silver sutures.

Convalescence.—The suprapubic wound healed per primam, there being no leakage at any time. The patient left the hospital in 12 days, voiding urine naturally through the urethra.

May 23, 1905.—Letter. I void urine in a good stream at intervals of from three to five hours during the day and five to eight hours at night. I suffer no pain. My sphincter is a little weak and at times there is a slight leakage. The patient is advised to wear a jock-strap, thus holding the penis against the abdomen with the idea of doing away with the slight leakage.

November 30, 1905.—The wounds have remained closed. I void naturally once at night, sometimes not at all, 14 ounces at a time. During the day the interval is about four hours, but there is occasionally a slight leakage which requires the use of a cloth. My general health is excellent. I am now 85 years of age.

May 10, 1906.—My condition remains the same as stated in the last letter with the exception of a slight leakage. My general health is good.

Pathological report.—The specimen consists of many lobules of various sizes with smooth encapsulated surfaces varying from 1 to 5 cm. in diameter, and weighs 200 grams. The sloughing piece removed later weighs about 40 grams. A number of lobules are covered with mucous membrane, the total area of which would probably amount to about 6 cm. in diameter. Section of the lobules show typical spheroids of the usual adenomatous hypertrophy.

Microscopic examination.—Two sections have been taken. I. Through a lobule covered with mucous membrane, a portion of which is vesical, and a portion urethral, both fairly well preserved. In the submucosa there are considerable œdema and round celled infiltration and numerous bundles of smooth muscle. The lobule is composed largely of glandular tissue with little stroma. The ducts are moderately dilated, and there is considerable intracystic outgrowth of epithelium of a papillomatous type. Epithelium is a tall columnar variety except in the few dilated acini where it is moderately flat. The stroma is composed of fibrous tissue and smooth muscle arranged more or less circularly around the acini in a rather loose structure. There are no masses of pure fibroma or myoma—considerable evidences of inflammatory processes are present. II. Section of another lobule shows more dilated ducts, and here and there considerable infiltration of round and polynuclear cells in the stroma. The lobule is surrounded by a thick fibrous capsule in which flattened acini are seen.

Case 17.—*Small hypertrophy of median and lateral lobes. 500 cc. residuum. Cure. Followed 31 months.*

No. 493. J. T. McL., age 54, married, admitted October 4, 1903.

Complaint.—" Frequency and difficulty of urination."

The patient had gonorrhœa about 23 years ago.

Present illness began about 15 years ago, the first symptom being frequency of urination which was most marked during the night. About five years later he noticed that the stream of urine was small, spiral and sometimes divided. In the next few years both difficulty and frequency increased and a burning during urination gradually appeared. About one year ago the patient began to have incontinence both night and day. He has suffered considerable pain in his bladder, but has never passed a calculus. Four years ago, on the advice of a physician, he used a catheter for two months, but he found the operation disagreeable and has only used the catheter occasionally since.

S. P.—The patient is now using a catheter on the advice of his physician. If he does not do this he has incontinence of urine and a large residuum. Sexual powers present.

Examination.—The patient is a fairly well nourished man with lips of good color. Heart and lungs negative. Pulse 96 to the minute, but of poor volume and tension. Abdomen negative. Right inguinal hernia is present. Left inguinal ring enlarged, but no hernia present.

Rectal examination.—The prostate is very little enlarged in the right lateral lobe, but the left lateral lobe is distinctly enlarged in length and breadth, and is closely adherent to the structures along the outer border. The contour is smooth, consistence firm, but not markedly indurated, seminal vesicles are not palpable. The fluid obtained by prostatic massage contains spermatozoa and pus cells, very few normal elements.

Cystoscopic examination.—Catheter passes with ease and finds about 500 cc. residual urine. The vesical tonicity is good. Cystoscope shows intravesical hypertrophy of slight degree of both lateral lobes with a sulcus between the two, and a small median lobe separated from each of the lateral lobes by a small sulcus. The bladder is considerably trabeculated, but there are no diverticula. Considerable cystitis. With finger in rectum and cystoscope in urethra the median portion is found to be thick, but the beak is palpable above the prostate.

Preliminary treatment.—The patient is advised to catheterize himself three times a day, to take urotropin and to drink water in abundance.

Urinalysis.—Slightly acid. Sp. gr. 1008. Trace of albumin. Microscopically, pus cells.

Operation, October 26, 1903.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes which were very small were easily enucleated, and the median bar was removed with the assistance of the tractor through the left lateral cavity without disturbing the urethra or the ejaculatory ducts. After the removal of the tractor the finger was inserted into the bladder and showed a small pedunculated median lobe which was too small to be engaged with the blade of the tractor. With the aid of the finger it was easily drawn into the left lateral cavity and enucleated, although only 8 mm. in diameter and weighing only G-2. The total weight of the prostate was 15 grams. A small tear was made in the mucous membrane covering the middle lobe. The wound was closed as usual with double tubes and gauze drainage. There was very little hemorrhage. Continuous irrigation was instituted on the return to the ward. Pulse at the end of operation 112, condition excellent.

Convalescence.—The patient reacted well. The temperature did not rise above 100°, and after the third day was normal. The gauze was removed on the second day and tubes on the fourth day, continuous irrigation being kept up for four days. Urine began to come through the penis about the 15th day, and on the 16th day a note was made that he was able to retain his urine for four hours. The fistula closed on the 21st day, and he was discharged on the 22d day. He had been walking about the wards since the 12th day. The catheter passed with ease, showed no evidence of stricture, and withdrew 40 cc. residual urine. Sounds up to No. 26 F. showed no evidence of stricture.

December 7, 1903.—Letter. I have been doing well, but one week ago epididymitis set in.

May 22, 1904.—Letter. I void urine about every three hours. I have never used a catheter and have had no instrumentation since the operation.

I void about one pint of urine each time, and the stream is large and free and without pain. I have erections twice a week and satisfactory sexual intercourse. The sexual desire seems to be slightly diminished. My general health is excellent. I urinate about three times every night, a pint at each time, and often pass three and one-half pints during the night.

November 30, 1905.—I void urine naturally a pint at a time at intervals of three hours. I have erections occasionally and sexual intercourse, but it is not entirely satisfactory. I have no fistula and my general health is fair.

May 7, 1906.—Letter. I void urine naturally five or six times during the day and two or three times at night, about one pint at a time. I suffer no pain. I have erections and sexual intercourse. My general health is much improved. I have gained 20 pounds, and consider myself completely cured.

Pathological report.—The specimen, G. U. 48, consists of three pieces of prostatic tissue weighing in all 15 gm. The consistence is rather firm, and an occasional spherical lobule is seen. The ejaculatory ducts have not been removed. No calculus present.

Microscopic examination.—The hypertrophy is a moderately glandular one with some formation of lobules which are rather rich in acini. The acini within these lobular areas are moderately dilated, the lumen is serrated, and they are lined by columnar epithelium. The epithelium in some acini is one or two layers in depth, the deeper layer being rather cuboid in type. In other acini the lining consists of numerous layers of epithelium. There is present in many quite extensive areas a well marked glandular and interstitial prostatitis. The arteries show a considerable degree of arteriosclerosis in many areas. Numerous corpora amylacea are noted.

Case 18.—*Considerable lateral enlargement. Very large median lobe. Complete retention of urine. Cure.*

No. 520. W. H. H. F., age 63, single, admitted October 16, 1903

Complaint.—"Complete retention of urine."

The patient had gonorrhœa in his youth.

Present illness began about two years ago with slight difficulty of urination. He soon began to have considerable dribbling at the end of urination. During the past year urination has become much more frequent and during the past month he has had to get up eight or ten times at night to urinate, voiding urine in small amounts and with considerable pain. During the last few days he has required catheterization. Erections have been absent for ten years.

Examination.—The patient is a sturdy-looking man. Mucous membranes of good color. Lungs somewhat emphysematous but clear. Heart slightly enlarged, but no murmurs. Abdomen negative.

Note on admission.—The patient has complete retention of urine. A catheter passes with difficulty and withdraws very bloody urine. The prostate is markedly enlarged, being about the size of a large lemon with the long diameter transverse. The median furrow and notch are obliterated.

The contour is rounded, and the prostate is smooth, elastic and fairly soft.

Cystoscopic examination is impossible, owing to hemorrhage.

Preliminary treatment.—A catheter was fastened in the urethra and continuous irrigation of the bladder secured. Urotropin grains 20 to 30 daily by mouth was administered. On October 22 the patient developed a left epididymitis.

October 26, 1903.—Operation. Ether. Perineal prostatectomy by the usual technique. The lateral lobes were fairly large and easily enucleated. The middle lobe measured 4 x 5 x 5 cm. and was easily delivered into the left lateral cavity and enucleated without tearing the bladder. The lateral cavities were packed with gauze, double catheter drainage was supplied to the bladder and the wound was closed as usual. Patient stood operation well, pulse at end 70. Continuous irrigation and infusion on return to the ward.

Convalescence.—The patient reacted well. The gauze packing was removed on the sixth day and the tubes on the eighth. A catheter was introduced into the urethra on the thirteenth day and removed on the eighteenth. He was up in a wheel-chair on the nineteenth day, and was discharged on Dec. 7, the forty-third day. His general condition was excellent, but there was still a small fistula in the perineum. Highest temperature after operation, Nov. 8, 102°.

January 29, 1904.—The fistula is closed. The patient says that he voids urine in a large stream and about 250 cc. at a time. When the bladder becomes full and the desire to urinate comes on, there is apt to be a leakage of a few drops of urine, otherwise there is no incontinence. A catheter passes with ease and finds 40 cc. of urine. He has not been instrumented and there is no evidence of stricture. Bladder capacity 395 cc.

March 29, 1904.—A silver catheter passes with ease. Residual urine 5 cc. is present and bladder capacity 450 cc. The cystoscope shows a fold of mucous membrane in the median portion of the prostate and a small lobular projection from the left lateral lobe of the prostate. There is no obstruction present. The ureters are easily seen and they are functioning normally. There is very little trabeculation and there are no pouches nor diverticula. The patient has been treated daily by intravesical dilatation from February 9 to March 29. At the beginning the bladder only held 220 cc. On the second day it held 260 cc., on the third 310 cc., on the fifth 345 cc., and on the sixth 410 cc. On March 21, 1904, 470 cc. were introduced at one time. Since then the amount has been slightly less. Under treatment the frequency has been considerably diminished.

April 19, 1904.—The patient voids urine once at night and four times during the day. His condition is excellent, there is no fistula, no incontinence.

February 1, 1905.—I void urine naturally and consider myself cured. Drink large amounts of water and void urine about nine times in twenty-four hours.

November 30, 1905.—I get up twice at night to urinate, but pass 250 cc. each time. I have no difficulty in urination, no incontinence and can hold urine from four to six hours during the day. I have not had erections for 10 years. Catheter passes with ease and finds 20 cc. of residual urine. There is no stricture or fistula present. His general health is excellent.

May 10, 1906.—The patient voids urine naturally at intervals of four or five hours during the day and once or twice at night, about half a pint at a time. He has no pain, no incontinence, no difficulty in urination, and considers himself cured. Erections which were absent before operation have not returned.

Pathological report.—Specimen G. U. 221. The specimen consists of two small lateral lobes, the left in two pieces, one 1 cm. in diameter, and the other 3 x 2 x 1 cm. The right lateral lobe measures 3 x 2 x 1 cm., and on section shows several distinct spheroidal lobules. The left lobe is firmer, and apparently very fibrous in character. Several areas of hemorrhage are seen. The prostate weighs about 15 grams. Three sections were taken for study.

Microscopic examination.—The hypertrophy tends towards the fibro-muscular type, although in some areas the bland tissue is fairly abundant. The acini in these areas show the usual typical picture. The stroma is largely composed of fibrous tissue, there being present practically no muscle. Some areas of prostatitis. The arteries show a moderate degree of arteriosclerosis.

Case 19.—*Large intravesical median lobe. Hematuria. Little difficulty. Cured. Followed 25 months.*

No. 504. R. M. D., age 54, married, admitted November 28, 1903.

Complaint.—" Hematuria."

Patient has never had gonorrhœa. About four years ago patient consulted Dr. DaCosta for supposed kidney trouble. The urine was found negative except for excessive acidity. He was advised to drink water in abundance and for this reason urination has been somewhat frequent for the past three years. He dates the actual onset about one year ago when he passed a few clots of blood with the urine without pain. During the past year he has had five attacks of painless hematuria, the last about one week ago. He has never passed gravel and never had any pain in the region of either kidney. At present he voids urine about every three hours during the day and once at night. He has never used a catheter, and urination is not very difficult. His sexual powers are slightly diminished, erections being insufficient, but ejaculations are normal.

Examination.—The patient is pale, but otherwise well in appearance. Heart, faint systolic murmur at apex; lungs and abdomen are negative. Rectal examination shows a considerably enlarged prostate forming a rounded mass about the size of a medium-sized orange, smooth, soft and elastic. The seminal vesicles are felt and there is no induration present. A catheter passes with ease and finds 220 cc. residual urine. The bladder

capacity is 450 cc. The cystoscope shows moderate enlargement of the two lateral lobes, and a sessile rounded median lobe. The mucous membrane covering the prostate is smooth and the source of hemorrhage cannot be made out. The bladder is moderately trabeculated, there is no cystitis present and no calculus. No vesical ulcer or tumor is to be seen. The ureters are hidden behind the median portion of the prostate.

Urinalysis.—Clear, neutral, sp. gr. 1022, no albumin, no sugar. Microscopically negative.

Note.—Although the patient suffered very little difficulty and frequency of urination, on account of the considerable size of the prostate and the attacks of intermittent hematuria, perineal prostatectomy was advised.

Operation, December 1, 1903.—Ether. Perineal prostatectomy by the usual technique. The left lateral lobe was the largest, measuring 5 x 3 x 2 cm. The right lateral lobe was smaller and was removed in two pieces. The median lobe was removed through the left lateral cavity and proved to be a globular mass about 3 cm. in diameter. The deeper portions of the lateral lobes were markedly adherent and a small area of mucous membrane was removed. The floor of the urethra and ejaculatory ducts was preserved. There was considerable hemorrhage, but this was controlled by a pack in each lateral cavity. Two rubber drainage tubes were passed through the urethra into the bladder and the wound closed as usual. An infusion of 1000 cc. of salt solution was given on the table, and his condition at the end was fair.

Convalescence.—The patient reacted well. Continuous irrigation was not used, on account of the desire to avoid vesical infection. The drainage tubes were placed in a receptable containing a solution of bichloride of mercury. The gauze was started on the second day and finally removed on the sixth. The rubber drains were removed on the eighth day. For two days the urine came entirely through the perineal wound, but on the tenth day it suddenly ceased and came entirely through the urethra, and after that there was no leakage through the perineum and the wound closed rapidly. As soon as the tubes were removed the patient had continence. Temperature between 100° and 101° for two weeks after the operation. He was walking about the hospital on the 14th day and was discharged on the 21st. Examination of the urine showed a few bacilli. He had been taking urotropin, seven and one-half grains three times a day, and this was then increased to five times a day.

December 29, 1903.—The patient is drinking large amounts of water and voids a great deal of urine, about 320 cc. at a time and at intervals of about two hours. There is no incontinence, but urination is often imperative. The urine is cloudy, and contains pus, but no bacteria. Silver catheter passes with ease, shows no evidence of stricture and finds only 10 cc. residual urine. The bladder capacity is large and the tonicity is excellent. Patient says he had one erection yesterday. He is discharged with directions to continue urotropin and helmitol intermittently.

Letter, June 16, 1904.—I void urine normally, do not have to get up at

night, and have no pain. The amount voided at each time is about one pint. The stream is large and micturition normal. Erections have returned, and I indulge in sexual intercourse. There is no incontinence.

December 2, 1905.—The wound has remained closed. I void urine naturally, four or five times during the day, not at all at night, and as much as a pint at a time. I have erections and satisfactory intercourse, but there seems to be less power. My health is excellent and I consider myself cured.

Pathological report.—Specimen G. U. 59. The prostate has been removed in four masses, and weighs 60 grams. The middle lobe was removed in one piece and weighs 10 grams. The left lateral lobe was removed in one piece and measures 5 x 3 x 2 cm. in size. The right lateral lobe is in two pieces, which together form a mass about the size of the left. A small area of mucous membrane has been removed along with the apex of the median lobe and measures about 1 x 1 cm. in size. The outer surface of the lobules and the cut surface shows numerous spheroids with intervening fibrous stroma. The deeper portion of the left lateral lobe is firmer in consistence, and on section shows numerous pin-head areas yellowish in color, and suggests malignancy slightly.

Microscopic examination.—The hypertrophy is a glandular one, the acini for the most part being arranged in lobules. Within these glandular spheroids the stroma is very small in amount, the acini are dilated and there are numerous off-shoots in the lumina of the ducts, oftentimes papillomatous in type. The interlobular stroma contains acini scattered here and there, and many of these show signs of activity. A few small areas of prostatitis are present. The stroma contains distinctly more connective tissue than muscle, and the blood vessels seem about normal. The area which suggested malignancy shows the acini crowded together, and filled with proliferating and degenerating cells, but no evidence of malignancy.

CASE 20..—*Considerable enlargement of lateral lobes, small median. Nephritis, suppression of urine. Cure.*

No. 517. M. V. C., age 78, married, admitted November 11, 1903.

Complaint.—"Hematuria. Frequent and painful urination."

The patient denied gonorrhœa. Is the father of 16 children, the youngest five years of age.

Present illness began 12 years ago when he passed a small amount of blood without pain. After that he had slight difficulty in urination and occasional hematuria. During the next few years hematuria became more frequent, but pain was always absent. Of late micturition has become very frequent and difficult, and on November 10, 1903, complete retention of urine came on for the first time. His physician was unable to catheterize him and brought him to the Johns Hopkins Hospital where a catheter was passed 32 hours after the onset of retention. His sexual powers are good, and his desire unchanged.

Examination.—The patient is well nourished. Mucous membranes of good color. Heart and lungs negative. Urine is slightly cloudy. Sp. gr. 1015. Albumin present. Microscopically, granular casts and pus cells present

Rectal examination shows the prostate moderately hypertrophied, soft, smooth, tender and about the size of a small orange.

Preliminary treatment.—Soon after admission a coudè catheter was fastened in the urethra. On the next day he had a chill and fever of 102°. During the next three days almost complete suppression of urine supervened, but after infusions and rectal injections of salt solution kidney action was again established. On November 16 attempt was made to perform cystoscopic examination, but without success, owing to tenderness, pain and hemorrhage. The bladder would hold only 40 cc. fluid. The urine still contains albumin, granular and epithelial casts and pus cells.

Operation, November 19, 1903.—Ether. Perineal prostatectomy by the usual technique. Two large lateral lobes and a small median lobe were easily enucleated. The urethra and ejaculatory ducts were preserved, but a small tear was made in the bladder in removing the median lobe. The wound was closed as usual with gauze packing for the lateral cavities and double drainage tubes for the bladder. A submammary infusion of salt solution was given and the patient stood the operation well.

Convalescence.—The patient reacted well, but had a chill soon after the operation. His highest temperature was 100°. Saline irrigation of the bladder was discontinued on the third day and the gauze completely removed on the fourth. The tubes were removed on the fifth day, and the patient was up in a wheel-chair on the sixth.

November 29, 1903.—For the last few days the patient has been irrational and temperature has been subnormal, but his pulse has been good. He was infused and 400 cc. salt solution given per rectum every four hours.

December 8, 1903.—The patient is improving slowly. Sinus in perineum persist.

December 16, 1903.—Slight pleurisy is present on the left side, but his temperature, pulse and respiration are normal.

December 19, 1903.—The patient has improved rapidly, is up and walking about.

December 23, 1903.—His general condition is excellent. The sinus is closing slowly, and most of the urine comes through the urethra. The patient is discharged (34th day). Urine is acid. Sp. gr. 1016. Albumin is present, and numerous pus cells, but no casts are seen.

The fistula closed on about the 45th day.

January 20, 1904.—Letter. The fistula has been closed for some time. I have little if any pain. I have no inflammation of the bladder and the urine seems normal. I void urine about every two hours, and have not used the catheter.

May 22, 1904.—Letter. I urinate once during the night and about every three hours during the day. The stream is large and free. Erections have returned and I have indulged in intercourse.

February 1, 1905.—Letter. Urination is normal, about six times in 24 hours, once or twice at night, and about a pint at a time. I have no pain. I have ceased to have erections, and this is what I regret the most.

November 30, 1905.—Letter. The perineal wound has remained closed. I void urine naturally about a pint at a time occasionally, about three times during the night and eight times during the day. I suffer no pain. Have no erections. My general health is good and I consider myself cured.

May 9, 1906.—Letter. I void urine normally, about twice during the night and often a pint at a time. I have no pain, the wound has remained closed, and I feel perfectly cured. My general health is excellent. I do not have erections.

Pathological report.—The specimen G. U. 53, consists of three lobes weighing in aggregate 90 gm. Two lobes are about equal in size and measure each 4 x 5 x 5 cm. in size. The third measures 1 x 1.5 x 2 cm. The three lobes are similar in character: the surface is nodular and lobulated, consistence elastic, homogeneous, on section a profuse exudate of turbid milky fluid exudes from the surface which is composed of lobules with intervening fibrous trabeculæ. An occasional dilated duct is seen.

Microscopic examination.—The hypertrophy is a lobulated glandular one with areas of dilatation and marked proliferation. Some cystic degeneration is present with flattening of the lining epithelium. The stroma between the acini except in the interlobular spaces is rather loose, and contains fair amounts of apparently young connective tissue. There is present also considerable muscle. Numerous areas of chronic prostatitis with interstitial infiltration are seen.

Case 21.—*Slight hypertrophy of median and lateral lobes. Catheterism. Emphysematous lungs. Cardiac murmurs. Excellent progress for 13 days. Sudden death from pulmonary thrombosis following enema on 14th day.*

No. 627. W. E. M., age 73, married, admitted November 20, 1903.

Complaint.—" Bladder trouble."

No history of gonorrhœa.

Present illness began two years ago with frequency and difficulty of urination which gradually increased, and six months before admission micturition became very difficult and painful. Daily catheterization was begun two months ago.

S. P.—Urination is very frequent, difficult and painful, and the catheter is used frequently by the patient on this account. The bladder is contracted and there is only a small amount of residual urine present.

Examination.—The patient is a fairly well nourished man with lips of good color. The arcus senilis is well developed.

Chest.—The chest is well formed, the lungs are clear throughout and somewhat hyperresonant. At the aortic area there is some blurring of the heart sounds with a suspicion of a diastolic murmur. The pulse is 70. The abdomen is negative.

Rectal.—The prostate is only slightly hypertrophied, smooth, firmer than normal, not tender. The seminal vesicles are negative.

Cystoscopic.—Coudè catheter passes with ease and finds residual urine

320 cc. The cystoscope shows a slight intravesical hypertrophy of the lateral lobe and a small rounded median bar. The ureters are easily seen, and there is only moderate cystitis and no stone present.

Urinalysis.—Cloudy, acid, 1020, albumin a heavy trace, no sugar, urea 15 gm. to the liter, 25 gm. daily. Microscopically, pus in considerable amount. No casts.

Operation, November 20, 1903.—Ether. Perineal prostatectomy by the usual technique. The posterior surface of the prostate showed only slight enlargement. The lateral lobes were very fibrous and removed with some difficulty. The median portion of the prostate was removed through one of the lateral cavities, and was small in amount, a small tear was made in the urethra. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. The patient stood the operation well, the pulse at the end being 80. Infusion and continuous irrigation on return to the ward.

Convalescence.—The patient reacted well. Pulse did not rise above 88 on the night of the operation and the temperature not above 99.2°.

November 21, 1903.—The patient has had a comfortable day. The pulse has varied between 68 and 88, and the temperature between 98.6° and 100.2°. He has been comfortable and the tubes have drained well.

November 22, 1903.—The patient has had a good day. 1580 cc. urine secreted, pulse good 72 to 84, temperature 99° and 100.4°.

November 24, 1903.—The patient has been comfortable. The pulse between 80 and 104, temperature 99° to 100.4°. The patient has been constipated, and received two enemata which were effectual.

November 25, 1903.—The patient had a good night, slept seven hours, and his condition is excellent. His pulse varies between 82 and 92, temperature between 99.2° and 99.6°. 1800 cc. urine secreted. Slightly constipated, one enema given, quite effectual. The patient is on soft diet. Since operation the pulse has had a peculiar collapsing quality.

November 26, 1903.—The gauze was removed to-day (sixth day). The condition of the patient is good. Temperature 99° to 100°, pulse 80 to 90. Urine acid, 1023, albumin a trace, no sugar, total amount 1800 cc. Total urea 34 gm.

November 27, 1903.—The gauze and tubes have been completely removed, the patient is in good condition. Temperature 98.6° to 100°.

November 30, 1903.—The patient is doing well. Pulse 70 to 80, temperature 90° to 98°.

December 1, 1903.—The patient has had a slight rise of temperature 100.4° associated with a slight epididymitis on the right side. Condition otherwise good. Pulse 75.

December 2, 1903.—The epididymitis is subsiding, and causes very little inconvenience. Pulse 80, temperature 100.3°. Patient up and about the ward. Condition excellent. Wishes to go home.

December 3, 1903, A. M.—The patient is in excellent condition. Temperature 98.7°, pulse 80. He is constipated and a high soap-suds enema is ordered.

P. M.—This morning the enema was very effectual, but immediately afterwards the patient vomited and suddenly collapsed. When seen by one of the house physicians five minutes later he was pulseless, of a whitish gray color, but the respirations were fairly good. Strychnine, atropine and ether were administered without effect, and in a very short time the respirations stopped and the patient died.

Autopsy.—(Résumé.) There was a firm organized clot with fresh clot built on it extending from the right auricle down the inferior vena cava. There was also a thrombosis of the pulmonary artery. Careful examination of the pelvic structures failed to throw any light on the origin of the embolus. There was some old clot in the region of the wound, but nothing unusual.

Examination of the interior of the bladder shows no intravesical prostatic hypertrophy. The prostatic orifice is about 5 mm. in diameter. The median portion of the prostate looks as if it had not been disturbed, though it is possible that a pedunculated intravesical mass has been removed. The urethra in its anterior portion communicates along the lateral wall with the cavity left in the removal of the right lateral lobe. The ejaculatory ducts are apparently preserved intact. The verumontanum, floor of the urethra and left lateral wall are uninjured. Small portions of the lateral lobes in their deeper portions have not been completely removed. There is no evidence of hemorrhage around the prostate or the rectum.

Pathological report.—The specimen, G. U. 66, consists of the three lobes of the prostate removed in four pieces, and weighs about 20 gm. The median lobe measures 2.5 x 2 x 2 cm., is oval in shape, somewhat irregular, and on section shows considerable gland tissue and a small amount of stroma. The left lateral lobe is a little smaller than the median, is composed of several large spheroids rather loosely bound together. The right lateral lobe is composed of two pieces measuring 3 x 2.5 x 2 cm. No mucous membrane, no ejaculatory ducts, no calculi.

Microscopic examination.—The hypertrophy is of a rather glandular type, the acini being small, closely aggregated with quite marked complexity of the acini. The stroma is compact and contains more connective tissue than muscle. The blood vessels seem normal. Some few small areas of round celled interstitial infiltration are present.

Case 22.—*Moderate hypertrophy of lateral and median lobes. Catheterism. Cure. No complications. Followed two and one-half years.*

No. 488. W. T. W., age 76, married, admitted Nov. 20, 1903.

Complaint.—"Incomplete retention of urine. Catheterism."

No history of gonorrhœa.

Present illness began four years ago with difficulty of urination which culminated in retention, which required catheterization. After that he had to be catheterized for two weeks. In January, 1901, patient had a chill followed by great difficulty in urination, and after that he had to be catheter-

ized for 10 days during which time he had fever, severe pain in the back and urethra. During the past two years he has at times been able to void without the catheter, but at others urination was so difficult or frequent that catheterization from two to four times a day was necessary. He has had several attacks of fever, chills and pain in the back.

S. P.—The patient is catheterized three times daily, about three hours after catheterization he is able to void a small amount of urine. The total quantity of urine voided in 24 hours is usually 1300 cc., of which 800 is removed by the catheter and about 500 cc. voided. He suffers no pain, and his general health is excellent.

Sexual powers.—He has erections, but has not had intercourse for several years.

Examination.—The patient is a well nourished man with lips of good color. Chest and abdomen are negative.

Rectal.—The prostate is considerably enlarged, is rounded, smooth, firm, but elastic, and has no areas of induration nor nodules. The seminal vesicles are not palpable.

Urinalysis.—Slightly cloudy, acid, sp. gr. 1010, albumin a marked trace, no sugar. Urea, 15 gm. in 24 hours. Microscopically, pus cells, hyaline casts and bacteria.

Cystoscopic examination.—A rubber catheter with a stilet passes with ease, and finds about 250 cc. residual urine. A cystoscopic examination made by Dr. Willy Myer, showed a moderately enlarged middle lobe on a broad base with very little enlargement of the lateral lobes. There was no calculus present. The bladder was trabeculated, but there were no diverticula. Owing to the pain caused by this examination the operator did not perform cystoscopy.

Operation, November 22, 1903.—In New York. Ether. Perineal prostatectomy by the usual technique. The lateral lobes were moderately enlarged, very adherent and were removed in several pieces. The median portion of the prostate was only moderately enlarged, and was removed in pieces through one of the lateral cavities. Examination with the finger showed no remaining prostatic obstruction. The urethra was torn, but no mucous membrane was removed and the ejaculatory ducts were preserved. The patient was infused during the operation and continuous irrigation was begun at the end.

Convalescence.—The patient was very little shocked and convalesced rapidly. He was up walking on the tenth day and the perineal fistula closed on the 16th day. Patient was discharged on the 28th day. Six weeks after the operation a catheter was passed and found a residual urine of 30 cc. and a bladder capacity of 120 cc. His physician then began hydraulic dilatation through a catheter and in two months the capacity had reached 250 cc.

March 23, 1904.—The patient is in excellent health, voids urine normally. Erections have returned. Has not had intercourse for years. A catheter passes easily and finds 10 cc. residual urine. Bladder capacity 250 cc.

Urine is acid and contains pus cells and bacilli. The perineal wound is healed and rectal examination shows an absence of prostatic enlargement. Urine is voided at intervals of from two to five hours.

May 20, 1904.—Letter. I can retain my urine five hours during the day and the same time at night. I pass 250 cc. at a time, have 10 cc. residual urine, suffer no pain, and my general health is excellent.

May 20, 1906.—Letter. I void urine naturally, from 150 to 175 cc. at a time. I suffer occasionally a very slight pain in the perineal wound, but it is not important. The catheter is occasionally used to wash out the bladder and finds 15 cc. residual urine. My general health is good, I have gained in weight and I consider myself cured.

Pathological report.—The specimen, G. U. 55, consists of the lateral and median portions of the prostate which has been removed in eight pieces, and weighs about 20 gm. The left lobe measures 3.5 x 2.5 x 2 cm. and has been removed in one piece. It is composed of small and large spheroids loosely bound together. The right lobe is in five small pieces, mostly spheroidal masses. The median bar and lobe is in two pieces, each about 2 x 1 x 1 cm. in size, and of similar appearance to the rest of the tissue. On section there is very little stroma, considerable dilatation of the ducts in places; but in other places there is considerable stroma, but no dilated acini. No mucous membrane has been removed, nor ejaculatory ducts. No calculi present.

Microscopic examination.—The tissue is a moderately glandular one, the amount of gland and stroma varying in different areas, but as a whole the gland tissue is considerably in excess of the stroma. The acini are rather small with occasional areas of moderate dilatation, especially in the acini of the spheroidal lobules. The stroma is rather dense except in the more glandular lobules where there is considerable spindle-celled tissue present. There is a fair amount of muscle fibers present in the interstitial tissue.

Case 23.—*Patient aged 81 years. Moderate enlargement of the prostate which was considerably indurated. Pain and hematuria. Calculus. 2000 cc. residuum. Death thirtieth day. Hypostatic congestion of lungs.*

No. 623. H. C. N., age 81, married, admitted November 14, 1903.

Complaint.—" Bladder trouble."

No history of gonorrhœa.

Present illness began about three years ago with irritation in the region of the bladder, and a little later hematuria. After that intermittent hematuria, but no pain, no passage of calculus, no obstruction to urination. Six weeks ago he felt uncomfortable in his lower abdomen and examination showed that his bladder was greatly distended. There was no frequency of micturition, no pain, only slight difficulty in urination, but he has become weaker, and on advice of a physician he presented himself for consultation.

Examination.—The patient is in good condition for his age, but his lips are pale. The lungs are negative, heart sounds are clear, but intermittent. There is considerable general arteriosclerosis.

Abdomen.—It is impossible to palpate anything, for much of the abdomen is filled with a distended bladder which reaches two inches above the umbilicus. Pressure on this area produces pain. The genitalia are normal.

Rectal.—The prostate is considerably enlarged, very hard and induration extends upward on each side to the seminal vesicles, the groove is obliterated and the surface of the prostate is rough. No enlarged glands are to be felt. A small coudè catheter passes with some difficulty, owing to a constriction along the entire prostatic urethra. Two liters of pale urine are withdrawn. The bladder is still not emptied, but it was thought inadvisable to remove all.

Urinalysis.—Lost.

Preliminary treatment.—Catheterization twice daily. Urotropin. After four days, catheterization had become more difficult, and it was impossible to introduce a catheter, sounds or filiform into the bladder, owing to obstruction at apex of the prostate. Retention of urine was complete. The bladder was distended to the umbilicus, and the patient was therefore advised to go to the hospital where his bladder was aspirated, 1800 cc. of urine being withdrawn.

Urinalysis of aspirated urine.—Acid, 1015, albumin a trace, and microscopically, a few hyaline casts.

The bladder was aspirated once every 24 hours for five days, about 1200 cc. of urine being withdrawn each time. The patient's condition remained good. The 24 hours total of urea was about 11½ gm. and as catheterization was still impossible, it was thought best to supply perineal drainage, and at the same time to remove a calculus which had been felt with the aspirating needle.

Operation, Nov. 24, 1903.—Spinal anesthesia. Perineal prostatectomy by the usual technique. Lithotomy.

The lateral lobes were very adherent and removed with difficulty, scissors being necessary. There was no median lobe present and with the finger in the urethra the bar did not seem sufficiently large to warrant removal. Rough oxalate calculus about 2 cm. in diameter was removed through the dilated urethra. Examination showed no other calculus. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. He was infused on the table and stood the operation well, but while being returned to the room there was a sinking spell, pulse became irregular and weak. He was given strichnine one-twentieth of a grain and soon rallied.

November 25.—Since operation yesterday patient has been comfortable. His pulse has varied between 88 and 100, his temperature 99.2°.

November 28.—The patient is doing well. There is profuse drainage through the tube, the temperature has not gone above 100.5°, pulse between 90 and 100.

December 3.—The patient has done well. Temperature 99°, pulse 95. Sleeps well. Total quantity of urine 1420 cc. to-day. Appetite is fairly good. He is on ordinary diet. The tubes and gauze are removed to-day.

December 5.—The tubes had to be replaced, owing to the fact that there was no drainage through the perineal wound, and the bladder became distended and painful. The total urine to-day was 1380 cc. Highest temperature 99°, pulse 88. Patient was up in a wheel-chair, and is quite comfortable.

December 11, 1903.—The patient has complained of pain, the pulse is weak and intermittent. A good quantity of urine has been secreted daily, 1200 to 1400 cc. Sp. gr. is 1010, total urea 15 gm., there is only a trace of albumin, some hyaline casts and pus cells. The tubes were removed again to-day, but as there was no drainage through the perineum for 12 hours he was catheterized, the bladder seems to have no tonicity.

December 15.—The patient is unable to void and is catheterized four times daily. He is very weak, and his pulse is intermittent. Infusion 1000 cc. salt solution to-night. The patient is still unable to void and is catheterized four times a day. The total urine is about 1500 cc., sp. gr. 1014, and there is considerable pus and albumin. The patient was up in a wheel chair yesterday for three hours and was very comfortable. His temperature has been normal, and his pulse stronger, but he looks weaker to-day.

December 20.—Lungs are clear but emphysematous. Heart sounds feeble with a faint systolic murmur. The pulse is very intermittent.

December 21.—There is an abundant secretion of urine, 1500 cc. of fair quality, but the patient is gradually sinking.

December 23.—The patient is much weaker and near the end. The lungs are full of fine râles, the pulse is rapid and shallow, 120 to 140. Still secreting an abundance of urine, 1580 cc. to-day.

Urinalysis.—Acid, 1017, albumin considerable, total urea 9.4 gm. Microscopically, pus cells, hyaline and granular casts. Temperature 100.8°. The patient's mind is clear. The bladder is still atonic and there is no escape of urine except through the catheter which enters easily and meets no obstruction.

December 24.—The patient died at 6 a. m.

Remark.—The remarkable feature in this case was that with a bladder which was distended two inches above the umbilicus, urination was very little difficult and at normal intervals. His attention was attracted by swelling of the abdomen. The result of the operation was not perfect, in that normal urination was never established. This seems to have been due to the extreme atony of the bladder, as a very large tube could be inserted through the perineal wound with ease. Had the median portion of the prostate been removed, it is possible that drainage would have been established, but the patient died apparently not from vesical or renal complications, but from old age and cardiac weakness. Occurring as it did one month after the operation it cannot be entirely attributed to the operation.

Pathological report.—Specimen, G. U. 65. The prostate has been removed in numerous irregular pieces. The weight of the entire prostate is 45 grams. It is composed of numerous small and large spheroids more or less firmly bound together. No mucous membrane or ejaculatory ducts have been removed.

Microscopic examination.—The hypertrophy is a glandular one with formation in spheroids, the spheroids being separated from each other by bands of stroma containing flattened acini. The culs-de-sac show the usual complexity due to the intraacinous growths. The stroma is rather dense, and is composed of connective tissue and muscle in about equal proportion, the relative amount varying in different areas. There is present quite an extensive prostatitis. The blood vessels are about normal.

CASE 24.—*Slight enlargement of median and lateral lobes. Castration and Bottini operations previously. Perineal prostatectomy. Recto-urethral fistula. Successful closure after two failures. Death at end of one year, pyonephrosis.*

No. 516. O. S., age 62, single, admitted May 22, 1902.

Complaint.—"Bladder trouble."

No history of gonorrhœa.

Present illness began about 11 years ago with difficulty in urination, but he had very little trouble for four years, when urination became very difficult and frequent, finally complete retention of urine set in and he led a catheter life for nine months. After that he catheterized himself only when unable to void. Micturition is usually very frequent, often six or seven times at night. During the past year retention has again been complete, and he has catheterized himself four or five times a day. In October, 1901, castration was performed in another city, and after three or four days he began to void naturally, and has not used a catheter since.

S. P.—Urination every hour, and always requiring considerable straining, stream being small and slow. The patient suffers much pain in the bladder, but has never passed calculi nor blood. He is habitually constipated and his general health is poor.

Examination.—The patient is a thin, nervous looking old man with lips of fairly good color. Pulse is 96, of good volume and only slight arteriosclerosis. Heart, lungs and abdomen are negative.

Genitalia.—Both testicles are absent. The scrotal wounds have healed firmly.

Rectal.—The outlines of the prostate are indistinct. There is a broad flat mass with indefinite borders, extending across from one side of the pelvis to the other, and upward towards the region of the seminal vesicles. It does not bulge towards the rectum, and it is impossible to say how much of it is prostate. The seminal vesicles cannot be felt.

Cystoscopic.—Rubber and gum catheters meet an impassable obstruction about seven and one-half inches from the meatus. A silver catheter passes with ease and finds 120 cc. residual urine and a bladder capacity of 250 cc. The cystoscope shows a moderately large intravesical hypertrophy of the lateral lobes and median portion in the shape of a collarette with a single sulcus between the lateral lobes in front. The bladder is markedly trabeculated with numerous small pouches and the bas fond behind the median bar is quite deep. No calculi are seen. With finger in rectum and cysto-

scope in urethra the median portion of the prostate is definitely increased and the entire prostate presents as a hard collar 2 cm. thick around the shaft of the instrument.

Urinalysis.—Cloudy, alkaline, 1010, albumin a trace, urea 13 gm. to the liter. Microscopically, pus cells and bacilli.

Operation, June 2, 1902.—Cocaine and morphia. Bottini operation. With blade number two of my instrument, three cuts were made, one posterior and two lateral each 2 cm. long with the instrument at a white heat. The patient stood the operation well and there was very little hemorrhage. The median cut was made with the guidance of a finger in the rectum.

Convalescence.—The patient reacted well, and urination was considerably improved. The residual urine rapidly decreased, but the patient continued to suffer pain. He was treated for several months by intravesical irrigations and urotropin internally with very little benefit. He then became very melancholic, avoided the association of other people and often kept himself confined to bed.

December 19, 1903.—The patient continues to be very melancholic. He suffers great pain in the bladder and urination is frequent and difficult.

Examination.—A catheter finds 50 cc. residual urine and a bladder capacity of 300 cc. The cystoscope shows a small rounded median lobe with a fairly deep cleft on each side. The incisions of the Bottini cannot be definitely recognized, but it seems probable that the clefts represent the two lateral incisions, and that the median portion has increased in size since the Bottini operation was performed. The bladder is only slightly trabeculated and there is no foreign body present.

Remark.—There is very little residual urine, and the patient urinates better than before the Bottini operation, but he complains considerably of pain and seems to strain during urination. It is therefore thought advisable to perform prostatectomy.

December 19, 1903.—Ether. Perineal prostatectomy by the usual technique. Two small lateral lobes and a median lobe were removed with considerable difficulty, owing to the fibrous character of the prostate and marked adhesions to capsule and urethra. The wound was closed as usual with double tube drainage for the bladder and light packs for the lateral cavities. The levator muscles were not drawn together. The skin wound alone being approximated with interrupted sutures. The patient stood the operation well, pulse at the end being 80. Continuous irrigation on return to the ward.

Convalescence.—When the gauze was removed on the third day a rectal fistula was discovered. The perineal catheters were removed on the ninth day and a catheter inserted through the meatus into the bladder. It remained in place for about a week, but as there was no apparent closure of the rectal fistula the rectal sphincter was divided, thus laying bare the fistula—January 6, 1904. The penile catheter was retained until February 13.

March 4, 1905.—The urinary fistula shows no evidence of healing and gas escapes through the urethra.

Operation, March 4, 1904.—Ether. Closure of urethral fistula, repair of rectum. The urethra was opened in the bulbous region and the prostatic tractor introduced. The scar tissue was then dissected from the perineal wound, the urethral fistula closed with interrupted catgut, the edges of the rectum freshened and sutured with a continuous suture of silver wire reinforced by interrupted catgut. The skin wound was partially closed Light iodoform gauze pack. A permanent catheter was placed in the bladder through the bulbar urethrotomy wound. The patient stood the operation well. Pulse at the end 78.

Convalescence.—The patient had an uncomfortable convalescence. Both wounds broke down. Urine escaped into the rectum and gas through the penis. He continued to suffer pain, was uncomfortable, and a second attempt to close fistulæ was made.

Operation, June 22, 1904.—Ether. Closure of recto-urethral fistula. The operation was done very much as before, except that the urethral fistula was not closed, but a drainage tube was brought out through it. The rectal opening was closed with interrupted sutures.

Convalescence.—The bowels were kept tied up for a week, and the patient suffered considerable pain. The gauze was removed on the fourth day and the drainage tube on the sixth day. The rectal wound again broke down, and urine again flowed into the rectum and out the perineal fistula and gas into the urethra.

October 1, 1904.—The rectal, urethral and perineal fistulæ persist. The patient suffers a great deal of pain, and voids urine very frequently. He has several times passed calculi, his bladder is contracted and there is considerable cystitis.

Operation, October 6, 1904.—Ether. Suprapubic cystotomy for drainage. Removal of a vesical calculus. Closure of rectal and urethral fistulæ through perineal incision. Fine silk was used in the closure of the rectal fistula, several layers of interrupted sutures being employed. The levator ani muscles were drawn together over the wound with catgut. The urethral wound was closed with a single layer of fine silk sutures. A light gauze packing was inserted and the skin was partially closed with interrupted sutures of catgut. Suprapubic drainage was supplied through a large tube around which the bladder was sewed with catgut. The patient was infused on the table, and stood the operation well, his pulse at the end being 80.

Convalescence.—The patient was put on diet of water and albumin. Lead and opium pills were given to prevent bowel movement. Suprapubic tube drained well, but on the third day urine leaked through the perineal wound. The bowels did not move for nine days. Calomel, Epsom salts, oil, and glycerine enema were used. Previous to this the patient suffered considerably from abdominal distention and pain.

October 16, 1904.—The patient is more comfortable and his condition is fairly good.

October 22, 1904.—The patient has been very excited to-day, thought he was in a cell and called for the police.

November 1, 1904.—The patient is quiet mentally, and the suprapubic tube is draining well. The rectal wound has not broken down, and the perineal urinary fistula is small.

November 21, 1904.—The suprapubic drain has been removed. A small amount of urine escapes through the perineum, but the rest is voided through the urethra. The patient complains of pain and requires morphine.

December 21, 1904.—The patient has been very melancholic during his entire stay in the hospital. He has had delusions of persecution and at times has been acutely insane for a short time. For the past 25 hours he has been irrational and has been crying almost constantly. His temperature which has been normal since October 9, suddenly arose to-day to 103.3°, and his pulse to 130. He was infused with 1000 cc. salt solution.

December 22, 1904.—The patient continues irrational, weak, pulse 134 to 160, temperature 103.6°. The respiration is labored and he has difficulty in swallowing. A catheter passes through the urethra into the bladder without difficulty, and finds no residual urine. The bladder holds only 50 cc. The perineal and suprapubic wounds are both open, but the rectal fistula is closed, and has been since the last operation.

December 23, 1904.—The patient died to-day. Autopsy showed double pyonephrosis, pyoureter, a markedly contracted bladder, considerable cystitis, small suprapubic and perineal fistulæ. The rectal wound is tightly healed, and there is no prostatic obstruction present.

Case 25.—*Considerable enlargement of lateral lobes. Small median bar. Very frequent and difficult urination. Castration previously. Cure. Followed twenty-nine months.*

No. 528. R. M. W., age 78, married, admitted January 9, 1904.

Complaint.—" Prostatic trouble."

No history of gonorrhœa.

Present illness began about ten years ago with increased frequency of urination. This gradually increased and urination became more difficult, until, in 1901 he voided as often as 30 times during the night and about every hour during the day. He had no pain and passed no blood. He then began to use a catheter and after that occasionally had complete retention of urine. In April, 1901, double castration was performed by a physician with some improvement, but the catheter was necessary as before.

S. P.—The patient urinates 16 or 18 times during the night and about every 1½ hours during the day, the catheter is only used occasionally. His general health is good, he suffers no pain. He has had no erections since he was castrated.

Examination.—The patient is well preserved for his age, with lips of good color. His lungs are emphysematous. Heart, slight systolic murmur at apex; abdomen, negative.

Rectal.—The prostate is considerably enlarged, symmetrical, smooth, soft and elastic.

Urinalysis.—Cloudy, acid, sp. gr. 1030, trace of albumin, no sugar, urea 24 grams to the liter. Microscopically, pus cells and bacilli in considerable number.

Cystoscopic examination.—Catheterization is difficult, owing to an obstruction about the middle of the prostatic urethra. A very small silk coudè catheter was finally passed. The urethral length is eleven inches. Residual urine, 100 cc. The cystoscope showed a fairly large median bar, a moderately enlarged right lateral lobe and a larger left lateral lobe, with a sulcus between the two. The bladder was trabeculated and inflamed. There was no foreign body present. With finger in rectum and cystoscope in urethra the beak could not be reached and a considerable median mass was felt.

Preliminary treatment.—Regular catheterization, urotropin, water in abundance.

Operation, January 12, 1904.—Perineal prostatectomy by the usual technique, except that the ejaculatory bridge was cut through and a large median bar removed in this way from beneath the urethra. The usual bilateral capsular incisions were made and two very large lateral lobes were easily enucleated without tearing the urethra or bladder. After their removal it was decided in view of absence of testicles to cut across the ejaculatory ducts and remove the median bar, which was thick and fibrous, thus doing away with the necessity of extracting it through one or both of the lateral cavities. The bar which is shown in the accompanying photograph (Fig. 33) was easily enucleated in this way, but a small tear was made in the floor of the urethra. The operation was done under spinal anesthesia, cocaine gr. ⅓, and was entirely satisfactory. A submammary infusion of 1000 cc. salt solution was given during the operation, which produced no shock. The wound was closed as usual with double tube drainage for the bladder, and light packs for the lateral cavities. The entire prostate weighed 70 grams. The right lobe weighed 34, the left 30, and the median 6 grams.

Convalescence.—The patient reacted well. The temperature rose to 101.5° on the day after the operation, but after that was very little above normal for two weeks. The gauze and tubes were removed on the fourth day.

January 20, 1904.—The patient looks weak, is nauseated, but the wound looks well.

January 31, 1904.—Since last note the patient has had very little appetite, an evening temperature ranging from 100° to 101° and occasional nausea. He has been given water in abundance, liquid diet, and has been up in a wheel chair as much as possible. Patient's appetite is good again and his temperature is normal.

February 13, 1904.—The patient has improved steadily. Is walking about the hospital and is comfortable. Urine came through the penis on the 27th day for the first time.

February 23, 1904.—The patient is discharged, forty-second day. The

fistula closed on the thirty-eight day. The wound is healed, and the patient is voiding urine naturally. His general condition is fairly good. His urine is clear, contains no albumin, and microscopically, only a few casts.

May 20, 1904.—Letter from physician. "A stricture has formed at a place where the urethra was incised which I have gradually dilated with steel sounds up to 15 English, previous to that he had incontinence, but now this has ceased and his urine looks good."

November 4, 1904.—Letter. "I have to void every one to three hours during the day, but my general health is good." He is advised to take bladder irrigations and to distend the bladder as much as possible by hydraulic pressure.

February 1, 1905.—I void naturally about once in two hours, about one-fourth of a pint at a time. I am steadily improving.

November 30, 1905.—I void urine about once in two hours, but during the first part of the night sleep three hours without urinating. I have some vesical irritability. My general health is very good. My wound is closed, and I feel very well for a man 80 years of age.

May 8, 1906.—Letter. "During the day I void urine naturally about once in three hours. During the night I void very frequently, probably from 10 to 20 times, and pass from a teaspoonful to a gill at a time, but during the day perhaps a half a pint. I suffer some pain when urinating. I suppose that my trouble is catarrh of the bladder and also kidney trouble."

Pathological report.—The specimen, G. U. 56, consists of four parts and weighs in all G-74. The right lateral lobe measures 6x4x2.5 cm., is fairly smooth, lobulated, elastic, and on section shows gland tissue with a moderate amount of stroma and some spheroids. The left lobe measures 5x4x2.5 cm., is smooth, oval and on section presents much the same appearance as the right. It weighs G-30. The median bar measures 3x2x1.5 cm., weighs G-9, and is fairly smooth and glandular. No mucous membrane or ejaculatory ducts are attached to this. The fourth piece is a portion of the posterior capsule and floor of the urethra, and contains a portion of the ejaculatory ducts.

Microscopic examination.—The hypertrophy in all three lobes consists of very much more stroma than gland tissue. The acini are all small, separated as a rule by very broad areas of stroma, and in many areas only vestiges of gland acini persist. Many times the acini seem like small tubules of solid cells, the acini being so compressed that no lumen is visible. Many of the larger acini are filled with proliferating epithelial cells. The stroma is almost entirely composed of fibrous tissue, and only occasionally are seen a few smooth muscle fibers. Everywhere throughout the stroma there is a marked round celled infiltration and occasional polynuclear cells are seen. About most of the acini there has been formed a large amount of new inflammatory tissue. The prostatitis is evidently one which is very extensive and of long standing. The arteries show a well marked degree of arteriosclerosis.

CASE 26.—*Considerable hypertrophy of median and lateral lobes of prostate. Urination every half hour, pain. Perineal prostatectomy. Recto-urethral fistula. Two operations to close fistula. Final cure. Followed 28 months.*

No. 584. R. K., age 61, married, admitted December 30, 1903.

Complaint.—"Frequency of urination."

No history of gonorrhœa.

Present illness began about five or six years ago, with frequency of urination. Since then there has been a gradual increase in difficulty and frequency. One year ago he began the use of a catheter on the advice of his physician. Of late he has ceased to use a catheter and finds that he has to arise very frequently, often 14 times during the night to urinate. He has pain when the bladder becomes full which persists during urination, but does not radiate to the end of the penis. There is considerable difficulty in starting the flow and much straining necessary before he starts to urinate. He has never had complete retention, no hematuria, no calculus.

Sexual powers.—Erections are present occasionally, but the patient has not attempted intercourse for two years.

Examination.—The patient is a well nourished man and his lips and mucous membranes are of good color. The lungs and heart are negative. Pulse of good volume and tension, but quite sclerotic, 88 to the minute. Hemoglobin, 70%. The abdomen is negative.

Rectal examination.—The prostate is considerably enlarged in both lateral lobes, firm, but elastic, smooth, no nodules, no induration; seminal vesicles not indurated.

Cystoscopic examination.—A coudè catheter passes with ease and finds 400 cc. residual urine. The cystoscope shows only a slight intravesical enlargement of the lateral lobes with a fair sized rounded median lobe, with a deep sulcus on each side. The bladder is chronically inflamed, but there is no stone present.

Urine.—Acid, 1013; cloudy; no sugar; albumin, a trace; microscopically, pus and bacilli.

Preliminary treatment.—The patient was catheterized three or four times daily for 18 days, during which time the residual urine varied from 300 to 500 cc. He was able to void only small amounts, and the total daily quantity was from 1400 to 1900 cc. The urine varied in specific gravity from 1015 to 1022, there was a small amount of albumin, some pus cells and a few granular casts, and the urine was acid. Under the treatment above described the patient improved considerably.

Operation, January 16, 1904.—Ether. Perineal prostatectomy by the usual technique, with the exception that no examination was made of the rectum at the end of the operation. The operator did not think, however, that he had made a tear into the rectum and no note was made of any particular difficulty being encountered in freeing the rectum from the prostate. The lateral lobes, which were moderately hypertrophied, were easily enucleated and a fairly large median lobe was removed through one of the lateral cavities with ease by means of the tractor.

With the finger a small pedunculated subcervical median lobe was removed (Fig. 42). A small tear was made in the urethra in so doing, but the floor of the urethra and ejaculatory ducts were preserved intact. The wound was closed as usual, with exception that the rectum was not examined and the levator ani muscles were not drawn together (up to this time this was not done as a routine procedure, although it had been done in the very first operation).

Convalescence.—The patient stood the operation well, pulse at the end being 94. Continuous irrigation was kept up for four days, when the gauze and tubes were removed. Two days later, during a bowel movement, feces escaped through the perineal wound. On the day following



FIG. 42.—Lateral lobes, moderate median bar, small pedunculated subcervical medium lobe.

the operation the patient complained greatly of abdominal pain and later pain in the back. He was given calomel, and 400 cc. salt solution, with potassium citrate as an enema to be retained, this was repeated three times a day for at least four days, a large rectal tube being used each time.

Remark.—In reviewing the case there seems to be no reason for this treatment as the patient was not nauseated, had no fever, temperature being normal, and his condition was excellent, with the exception of pain in the abdomen. It is possible that the traumatism produced by the frequent introduction of the large rectal tube caused necrosis of the rectal wall adjacent to the wound and led to the fistula, but as the operator did not examine the rectum after the operation and did not cover it by approxi-

mating the levator muscles he cannot be certain what caused the breakdown.

January 30.—Four days ago the rectal sphincter was stretched with the patient under ether; since then the communication between the rectum and perineal wound has been very free. The patient feels well and sits up in a chair. All urine escapes through the perineum.

February 4.—Most of the urine passes through the penis; some feces still discharge through the perineal wound. The perineal wound is packed with iodoform gauze.

February 11.—Little improvement. The patient passes feces through the penis when the bowels move, and considerable urine comes through the rectum.

February 20.—The urine starts through the penis but very soon goes into the rectum. Gas and feces escape through the penis. The patient voids urine at intervals, has good control and has no pain in his bladder.

Operation, February 20, 1904.—Ether. Closure of urethro-rectal fistula. A probe was introduced through the sinus and perineum and the sinus was then excised through an inverted V-incision in a scar of the previous operation. After both fistulæ had been thoroughly exposed an incision was made in the bulbous urethra and a catheter inserted through it into the bladder. The rectum and urethral openings were then closed with fine sutures of catgut, and these were reinforced with heavier catgut sutures. The urethral catheter was sewed to the edge of the bulbous urethrotomy wound for permanent drainage.

Convalescence.—The patient suffered considerably from pain. The catheter did not drain well, and caused so much pain that it was removed on February 24.

February 25.—Urine escapes through the perineum and rectum. The patient has suffered greatly from diarrhœa since the operation and this has caused the wound to break down.

March 2.—Fecal matter comes through the perineal wound in considerable amount, and urine entirely through the perineum and rectum.

March 12.—The patient is much improved. Nearly all the feces pass through the anus. Urine comes mostly through the penis. Sinuses show evidence of closing.

March 19.—Patient is discharged to-day (four weeks after second operation). He feels well, voids urine every four or five hours. At night does not void from 12 to 6 a. m. Most of the urine comes through the urethra in a large free stream and without pain. Ten days ago the amount of fecal matter coming through the perineum began to diminish and for the past few days there has been no escape of fecal matter. There has been no fecal matter nor gas come through the urethra since the second operation.

April 16.—The patient is very comfortable. Only a few drops of urine escape through the perineum and very little gas and no fecal matter. There is no connection between the rectum and urethra. Voids urine at intervals of six hours with perfect comfort.

August 2, 1904.—The patient feels well, voids urine at intervals of five or six hours. Both rectal and urethral fistula are closed.

November 30, 1905.—I void urine naturally, one pint at a time, about every four hours. A few drops of urine still escape through the perineal fistula. Erections are present. My health is good and I have gained 50 pounds. I have no pain and I consider myself cured.

February 16, 1906.—Letter. I void urine once during the night, occasionally twice, and generally six times in 2 hours. The fistula is improving and sometimes for nearly a week there is no leakage. Occasionally a slight amount of gas passes through the penis, but never any fecal matter, and no fecal matter ever passes through the perineum. There is no tenderness about the bladder, but at times a little pain when urinating. My general health is very good.

May 17, 1906.—Letter. I void urine naturally three or four times during the day and generally twice at night, about a pint at a time. At times I suffer slight pain during urination, but only occasionally. I have erections, but have not attempted intercourse. The perineal fistula is not entirely closed, occasionally eight or ten drops of urine escape through it. My general health is good, I have gained in weight, and I am entirely cured of my prostatic trouble.

Pathological report.—Specimen G. U. 58. The prostate has been removed in four pieces and weighs about 35 grams. It consists of a left lobe 4.5 x 3 x 2 cm. in size, the right lobe 4.5 x 2.5 x 2 cm., a median bar globular in shape and about 2 cm. in diameter, and a small intravesical lobe about 8 mm. in diameter. The specimens are covered by smooth mucous membranes, are elastic and present the usual appearance of benign glandular hypertrophy.

Microscopic examination.—The hypertrophy is a glandular one with the formation of spheroidal lobules. The acini show rather marked cystic dilatation in areas. The interlobular stroma contains some acini which are flattened and elongated. The stroma is comprised for the most part of connective tissue, although there is present a considerable amount of muscle. A rather extensive chronic prostatitis is present and in areas this has led to the formation of considerable periacinous sclerosis with consequent compression and partial atrophy of the acini. The picture in these areas would suggest a primary glandular proliferation with subsequent atrophy of the gland elements as a result of inflammation. The blood vessels show moderate degree of arteriosclerosis in these areas.

CASE 27,—*Moderate hypertrophy of median and lateral lobes. Considerable pain and hematuria. Cure.*

No. 606. J. T. N., age 58, married, admitted January 21, 1904.

Complaint.—"Enlarged prostate—cystitis."

The patient has never had gonorrhœa.

Present illness began in May, 1903, with a slight difficulty of urination. At the end of a month blood appeared at the end of each urination, which

was very difficult. His physician then passed a catheter and drew away about two quarts of urine. He was catheterized once daily for a month, and after that urination was fairly satisfactory until September, 1903, when dysuria and hematuria returned. His physician then passed sounds twice a week for a month, and during the next three months the patient got along fairly well by using the catheter at bed time. In January, 1904, urination became much more difficult and a severe hemorrhage occurred.

S. P.—The patient is voiding urine every hour with considerable difficulty. Hematuria is present, sometimes large clots are passed. He has no pain except in his bladder, has not lost weight. His sexual powers are normal.

Examination.—The patient is well nourished. Heart, lungs and abdomen are negative. There is no arteriosclerosis and his pulse is good. Genitalia are negative.

Rectal examination.—The prostate is considerably enlarged, smooth, fairly firm but homogenous and not nodular. The seminal vesicles are not palpable.

Cystoscopic examination.—A catheter enters with ease, but withdraws only 32 cc. residual urine. (At a previous examination complete retention of urine was present and the bladder reached the umbilicus.) The cystoscope shows two large intravesical lateral lobes with a very small median bar connecting them. The bladder is moderately trabeculated and inflamed. The urine is cloudy, acid, and contains pus cells in abundance.

Operation, January 21, 1904.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were moderately enlarged, soft and easily enucleated. The median portion of the prostate was delivered by the tractor into one of the lateral cavities and enucleated, being about 3 cm. in diameter. The urethra and ejaculatory ducts were preserved, but a small tear was made in removing the median lobe. The perineal wound was lightly packed with gauze, double catheter drainage was introduced into the bladder through the perineal wound which was closed as usual. The patient was infused on the table and continuous irrigation was provided on return to the ward. The patient stood the operation well.

Convalescence.—The catheters were not removed for six days, and for four days there was considerable hemorrhage from the bladder (as before operation). Highest temperature was 102°, but on the fourth day the temperature was normal. Urine did not come through the urethra until the sixteenth day.

February 22, 1904.—There has been no wetting of the perineal pad for the past four days. The patient is comfortable, but gets up three times at night to urinate. His condition is excellent. He is discharged to-day.

April 19, 1904.—The fistula is again opened, but only a few drops escape through it. He suffers no pain, and voids urine in a large stream at intervals of five hours. Erections have returned. The fistula is curetted. (It closed finally three months after the operation.)

May 19, 1904.—A pin point fistula is still present. Urination is normal.

The patient goes to bed at 10 o'clock and gets up at 6 o'clock to urinate for the first time. Sexual powers are normal. Catheter passes with ease, no residual urine present, bladder capacity 500 cc. Urine very slightly cloudy, acid, a few pus cells and bacilli present.

June 21, 1904.—The patient has been curetted with the gimlet twice. The fistula is now closed. Urination and sexual powers normal.

February 1, 1905.—Letter. I am cured. I void urine four times during the day and once at night, one-half pint at a time.

November 30, 1905.—Letter. I void urine once at night and four or five times during the day. Occasionally I suffer pain at the end of the penis and urination is slow. Erections and sexual powers are satisfactory. I have had no complication since the operation.

February 7, 1906. The patient voids once during the night and at intervals of four hours during the day. Micturition free, and only a slight pain occasionally at the end of urination. He has erections and occasionally intercourse, but the amount of ejaculated fluid is slight and ejaculation is accompanied by a smarting sensation in the perineum.

Examination.—The urinary stream is large, the urine cloudy, acid, contains a very few pus cells and no bacteria. The cicatrix is firm. Rectal examination shows no prostatic enlargement, a catheter passes with ease and finds no residual urine. The bladder capacity is 600 cc.

Pathological report.—Specimen, G. U. 67, consists of four pieces and weighs 31 gm. The median lobe is almost spherical, about 1.7 cm. in diameter and weighs 3 gm. The left lateral lobe is the larger, has been removed in two pieces and measures 4.5 x 4 x 2.5 cm. The right lobe is about 2½ cm. in diameter. The three lobes are similar in character, surface irregularly lobulated, cut surface showing numerous spheroids with moderate dilatation of the acini. There is no mucous membrane nor ejaculatory ducts present.

Microscopic examination.—The hypertrophy is a moderately glandular one, the acini showing a tendency towards aggregation in areas. The acini are moderately dilated, and the lumina rather complex. Some of the acini show considerable adenocystic papillomatous changes. The stroma is rather dense; is largely made up of connective tissue, although here and there a fair amount of muscle is present. The arteries show a moderate degree of thickening.

Case 28.—*Slight enlargement of median and lateral lobes. Vesical calculi. Litholapaxy. Bottini operation. Perineal prostatectomy. Combined operation to close recto-urethral fistula. Cured. Followed two years and four months.*

No. 379. H. S., age 75, married, admitted April 11, 1903.

Complaint.—" Complete retention of urine. Catheterism—pain."

Patient had gonorrhœa ten years ago. It lasted several months, but was finally cured without complications arising. No bladder trouble until three years later. Present illness began seven years ago with nocturnal incontinence of urine. During the next three years the bed was wet almost every night.

About four years ago patient had difficulty in urination, and in a short time retention of urine came on. He was catheterized and since then has been unable to urinate. For two years it was only necessary to use the catheter twice a day, but for the past two years he has suffered gradually more and more pain, and he has had to catheterize himself more and more frequently.

S. P.—The patient catheterizes himself four times in 24 hours. Is unable to void naturally. He suffers considerable pain in the bladder particularly when it is emptied by the catheter, and at times severe pain in the rectum and urethra which is increased on walking.

Sexual powers.—No note made.

Examination.—The patient is rather emaciated, but with lips of good color. The pulse is 64 to the minute, volume good, moderate arteriosclerosis. Chest and abdomen are negative.

Genitalia.—The left epididymis is enlarged and tender.

Rectal.—The prostate is slightly enlarged, contour is rounded, consistence soft, no nodules and no induration. Right seminal vesicle is soft, the left slightly indurated.

Urinalysis.—Cloudy, alkaline. Sp. gr. 1018. Microscopically, pus cells, blood, and bacteria.

Cystoscopic examination.—A coudè catheter passes easily and finds 230 cc. of urine present. The patient has complete retention of urine. The cystoscope shows four stones, two small and two fairly large, all fairly smooth and white in color. Study of the prostatic orifice shows a small median lobe with a shallow sulcus on either side. The lateral lobes are very little enlarged, and there is no cleft between them in front. With finger in rectum and cystoscope in urethra the beak can be felt and the thickness in median portion is only moderately greater than normal.

I. *Operation, April 13, 1903.*—Ether. Litholapaxy. The largest stone caught had a diameter of about 3 cm. Considerable difficulty was experienced in getting the calculi, owing to the trabeculated condition of the bladder and the middle lobe of the prostate, but as no "clicks" were finally obtained by the evacuating tube no further attempts were made.

Convalescence.—The patient did not convalesce well. The temperature rose only to 100.5°, but he suffered greatly with pain so that the retained catheter had to be withdrawn. After that he was catheterized every three or four hours, but he became irrational and weak. It was evident that another operation was necessary to relieve the prostatic obstruction.

II. *Operation, April 24, 1903.*—Bottini operation. Cocaine and morphia. Three cuts with blade No. 3. A posterior median 1.8 cm. long, right lateral 2 cm. long, left lateral 2.2 cm. long. There was very little hemorrhage and the patient suffered little. A catheter was fastened in the penis for continuous drainage.

Convalescence.—The patient convalesced poorly. He had a slight fever, suffered considerable pain, voided with difficulty and had considerable residual urine for which catheterization was necessary. For many days he

was uremic and irrational and had a severe bronchitis. He was treated by active hydrotherapy and was kept in a wheel-chair as much as possible. He finally left the hospital June 1, rational, but very weak, voiding urine in small amounts, but still dependent upon a catheter.

February 1, 1904.—The patient has been unable to void urine and has had to catheterize himself twice daily. He has suffered severely from pain which was worse when he was on his feet, and as a result has remained in bed continually. Examination showed a prostate very little larger than normal with a finger in the rectum. The surface was irregular and the consistence hard. A silver catheter entered with ease and found a large bladder. Careful searching failed to reveal a calculus. With finger in rectum and catheter in urethra the tissues between the two were very little greater than normal. Perineal prostatectomy was advised, although the patient was extremely weak.

III. *Operation, February 1, 1904.*—Spinal anesthesia. Perineal prostatectomy by the usual technique. Two very small lateral lobes and a small median bar were excised with considerable difficulty owing to their fibrous character and adhesions to the capsule, urethra and bladder. A tear was made in the urethra, but no mucous membrane was removed. The bladder was carefully searched with metal instruments and no stone was found. The wound was closed as usual with the exception that a gauze pack was placed between the posterior surface of the prostate and rectum which was not examined for a tear and the levator muscles were not drawn together with catgut sutures. The lateral cavities were also packed with gauze and double catheter drainage was supplied. The anesthesia was perfect. There was considerable shock after the operation and intravenous transfusion of 1000 cc. salt solution was given.

Convalescence.—The patient reacted well, had no fever and suffered no pain. On the day following the operation bubbles of gas passed out through the wound, and after the gauze was removed on the third day fecal matter escaped through the wound. He convalesced slowly, but was able to void naturally and without pain. The rectal fistula did not close and urine escaped into the rectum and gas into the urethra. He left the hospital on March 28, much improved in general health.

October 9, 1904.—The patient continues to have pain, especially at the end of urination, and the rectal fistula is still present. Examination with the cystoscope shows three calculi, one of moderate size in the bladder. No prostatic enlargement was present. Urine is voided very frequently, and most of it passes into the rectum. The patient is weak and emaciated.

IV. *Operation, November 10, 1904.*—Ether. Suprapubic cystotomy for drainage. Perineal operation to close rectal and urethral fistulæ and to remove vesical calculi. The patient was first placed in the Trendelenberg position, the bladder opened through a small incision and the calculi removed. Examination showed no fistula in the bladder and no prostatic obstruction. The vesical wall was then closed around a large rubber drainage tube and the patient placed in the lithotomy position. The rectal and

the urethral openings were exposed through incisions in the old scar. The rectal opening was small (less than 1 cm. in diameter) and connected directly with the anterior portion of the prostatic urethra. After excision of scar tissue, the rectal wound was closed with interrupted sutures of fine silk and reinforced by a second row of fine silk and another row of catgut. The urethral wound was also closed with fine silk sutures, and the cavity between the two was lightly packed with gauze and the skin wound was partly closed with catgut. The patient stood the operation well and convalesced satisfactorily. The suprapubic drain was kept in place for about four weeks until the perineal wound had healed completely. The rectal and urethral fistula healed per primam and after the removal of the suprapubic drain this wound closed rapidly and normal urination was established through the penis.

February 1, 1905.—Letter. I void urine naturally, retaining it six hours during the night and about three hours during the day. I have a slight irritation in the urethra but no pain. I have no erections. My health is fairly good and I consider myself cured by the operation.

February 13, 1906.—The wounds have remained closed and there is no fistula. During the day I do not void urine for three or four hours, but for some reason after retiring after 10 p. m., I awake at 1 a. m. to urinate and after that I am awakened every two hours with a desire to urinate. My general health is fair, but I am getting old. I do not have erections.

May 11, 1906.—Letter. I void urine naturally, three or four times during the day, and not until the latter part of the night. I am then wakeful and void frequently. I suffer no pain. I do not have erections. My general health is good, and I have gained in weight. I consider myself cured.

Pathological report.—The specimen, G. U. 86, consists of the prostate removed in six pieces, and weighing in all about 15 gm. Each lateral lobe was removed in two pieces and they are about equal in size. The median lobe is in two pieces. The surfaces are irregular, considerably torn, and on section are rough and fibrous with here and there dilated acini and evident gland tissue is seen. There is no arrangement in spheroids in some of these pieces, but in others it is present.

Microscopic examination.—The hypertrophy is of a rather mixed character, there being considerable areas in which hypertrophy is of a fibromuscular nature, and again other areas in which the acini are numerous, and show the picture presented by the usual glandular hypertrophy. The stroma contains a large amount of muscle, this being sometimes arranged in definite bundles. In the more glandular areas the muscle is not so evident, although it is fairly abundant. There is considerable round celled infiltration in the stroma. The arteries show a moderate degree of arteriosclerosis.

CASE 29.—*Considerable enlargement, lateral and median lobes. Seven calculi. Patient in poor condition. Cured. Followed 27 months.*

No. 549. A. D., age 75, widowed, admitted February 11, 1904.

Complaint.—" Difficulty in urination, catheterism."

He never had gonorrhœa.

Present illness began six years ago with difficulty of urination and gradually got worse until complete retention of urine came on five years ago. He was then catheterized three times, but did not again require it until two years later, when he used the catheter four times. After that the catheter was employed once in every two or three months until three months ago, since which time he has used the catheter from three to four times a day. He is now able to void very little without the catheter. During urination he occasionally has pain in the bladder and urethra. He has not lost weight and his general health is excellent. Erections of the penis are still present occasionally, but he has not attempted intercourse for years.

Examination.—The patient is rather feeble in appearance, his arteries are markedly sclerotic, but his pulse is regular and of good quality, and 100 to the minute. The heart, lungs, and abdomen are negative.

Rectal examination.—The prostate is considerably enlarged forming a smooth elastic mass about the size of a small orange. The seminal vesicles are not palpable, there is no induration, no glands and the rectum is not adherent.

Cystoscopic examination.—A catheter passes with ease, but produces hemorrhage. The cystoscope came in contact with a calculus in the posterior portion of the prostatic urethra. There were present also three or four calculi in the bladder, but it was impossible to get a satisfactory examination on account of hemorrhage.

Operation, February 16, 1904.—Ether. Perineal prostatectomy by the usual technique. The prostate was removed in three large and one small pieces and weighed 91 grams. A small tear was made in the left lateral wall of the urethra, but the bladder and the ejaculatory ducts were not injured. After removal of the tractor a finger was inserted and a small stone was found in the prostatic urethra and removed. A stone forceps was then introduced in the bladder and six calculi extracted through the prostatic urethra. The four larger calculi measured 2 x 1.5 x 1.5 cm. in size. The lateral cavities were packed with gauze. A double catheter drain was put in the bladder and the wound closed as usual. The patient stood the operation well. Pulse at the end of the operation 108. Infusion on table continued on return to ward.

Convalescence.—The patient convalesced slowly, but had very little fever. The temperature for the first 17 days being normal, it then rose to 102° and was accompanied by nausea and vomiting, but fell to normal the next day. The tubes and gauze were removed on the 8th day. The patient was out of bed on the 14th day, but was weak and his appetite was poor. After the third week he improved slowly but steadily and was discharged on the 39th day. At that time patient was able to retain urine for four hours, voided freely, and had no incontinence. The wound was closed, and the bladder held 240 cc. The fistula afterwards reopened and did not close finally until three months after leaving hospital.

March 15, 1904.—The patient voids twice during the night. There is still a slight leakage through the perineum. A silver catheter passes with ease and finds only 5 cc. residual urine. The bladder is contracted, holding only 165 cc. on forced distention. The perineal fistula will admit a fine probe.

March 22, 1904.—The bladder has been forcibly distended by hydraulic pressure daily. Under this treatment the capacity has increased from 165 to 240 cc in one week. He now voids eight times in 24 hours. The perineal fistula is healed and he has complete control of urine which is quite purulent and contains numerous bacilli.

May 20, 1904. Letter I can hold my urine six hours at night and four hours in the day. I have not used a catheter and urination is satisfactory. The fistula is not closed and a few drops escape at each urination. I suffer no pain, have no erections. My general health is good.

February 1, 1905. Letter. I am cured. Can void urine naturally, generally four times during the day and twice at night, half a pint at a time.

November 30, 1905.—The wound is healed and the urination is normal. I am entirely cured. My general health is excellent and I work on the farm. I get up twice at night to urinate.

May 20, 1906. Letter. I void urine naturally, three or four times during the day and once or twice at night, and in normal quantities. I have no pain, no erections, and have had no complications nor treatment. My general health is good, and I consider myself cured.

Pathological report.—The specimen, G. U. 68, consists of three lobes of the prostate which have been removed in seven pieces and weighs 91 gm. The left lateral lobe consists of four pieces and weighs 33 gm. It is fairly smooth, round, and on section shows considerable gland tissue with a fair number of dilated ducts, and a small amount of stroma. The right lateral lobe was removed in one piece, measuring 4 x 5 x 3 cm. in size, and is similar in appearance to the left. The median lobe has been removed in two pieces and weighs 26 gm. It is more glandular and has more dilated acini than the lateral lobes. No mucous membrane, no ejaculatory ducts, no calculi.

Microscopic examination.—The hypertrophy is a glandular one and much the same character in all three lobes. The amount of stroma varies in different portions, but as a whole the gland tissue is in excess. In the lateral lobes there are areas of marked cystic dilatation, and the majority of the acini are moderately dilated. In places there is the usual complexity of the alveoli and evidence of glandular proliferation. In the acini, which have undergone cystic degeneration, the epithelium is for the most part of a low cuboidal type. In the middle lobe the alveoli do not show as much evidence of cystic degeneration as in the lateral lobes, but the ducts are considerably dilated. The stroma, which is rather dense in character, is composed mostly of fibrous tissue, although in areas the muscle predominates. No areas of prostatitis noted.

Case 30.—*Moderate enlargement of median and lateral lobes. Large diverticulum with small orifice on anterior wall of bladder. Excision of diverticulum. Perineal prostatectomy. Cure. Followed 27 months.*

No. 558. J. R. B., age 63, married, admitted February 18, 1904.

Complaint.—"Difficulty and frequency of urination. Pressure in the lower abdomen."

He has never had gonorrhœa or previous urinary trouble.

Present illness began about two years ago with slight difficulty, and frequency of urination. Since then there has been a gradual increase in the symptoms of obstruction and occasionally he has attacks of pain, dull in character, located in the perineum and neck of the bladder, and lasting only a short time. At times he voids three or four times an hour, but at other times goes as long as two hours without urinating. These attacks of great frequency are not associated with pain, but seem to be due to a constant pressure in the lower abdomen and a desire to urinate which persists after micturition. Sexual powers are normal, but not entirely satisfactory.

Examination.—Patient is a healthy looking man. Very slight arteriosclerosis. The pulse is irregular and a presystolic murmur is present at the apex. Percussion of the abdomen shows considerably distended bladder reaching almost to the umbilicus and an area of dulness extending upward and outward from the bladder into the right iliac fossa. The genitalia are normal. The prostate is moderately enlarged, smooth, elastic, soft, without induration or nodules. The seminal vesicles are not palpable. The urine is clear and acid. Sp. gr. 1020. No albumin, no sugar. The prostatic secretion contains actively motile spermatozoa, lecithin bodies, a great number of large granule cells and no pus cells.

Cystoscopic examination.—A coudè catheter passes with ease and withdraws 1200 cc. residual urine. Study of the prostatic orifice shows a moderate hypertrophy of both lateral lobes and a small median bar. The bladder is moderately trabeculated. On the anterior wall of the bladder about 2 cm. distance from the median line on the right side is the orifice 1 cm. in diameter of a large diverticulum. The cystoscope can easily be introduced through this opening and shows a large extra-vesical cavity lined with smooth mucous membrane and extending far backward along the right lateral wall of the bladder. There is no cystitis present.

Note.—Owing to the position of the diverticulum and the small orifice it was thought best to remove it at the same time that prostatectomy was done.

Operation, February 22, 1904.—Ether. With the patient in the Trendelenberg position the anterior wall of the bladder was exposed in the median line. Diverticulum was found to be of great size filling the space between the bladder and right wall of the pelvis, the sacrum and the pelvic peritoneum. Its walls were very thin and it contained probably 500 cc. of urine. It communicated with the bladder by a narrow orifice about 4 cm. above the prostato-vesical juncture and 2 cm. from the median line on the

right side of the anterior wall of the bladder. The neck of the sac was caught between two clamps, divided and then easily enucleated. The orifice was then inverted and closed by a purse string catgut suture. The bladder was not opened and the suprapubic muscular wound was closed with a small area for drainage. The patient was then placed in the lithotomy position and the prostate enucleated by the usual technique. The lateral lobes measured 3 x 4 x 5 cm. in size and the median bar about 3 cm. in diameter. The ejaculatory ducts and urethra were preserved with the exception of a small tear that was made in removing the median bar through the left lateral cavity. The wound was closed as usual with double tube drainage. There was very little hemorrhage and the patient stood the operation well.

Convalescence.—Patient reacted well. Evening temperature between 100° and 101° for seven days, after that normal. The gauze was removed from the perineal wound on the third day and the tubes on the fourth day. The suprapubic gauze was removed on the fifth day, and there was no leakage of urine through the suprapubic wound. On the tenth day urine was still coming through the perineal wound, but the patient had perfect control and could retain his urine for six hours.

March 19, 1904.—Patient voids urine every three or four hours in the day and five to six hours at night. The perineal wound is healed (closed on the 26th day). Urine is cloudy and contains pus cells and bacilli. Patient was treated actively by urotropin and intravesical irrigations of 1 : 5000 nitrate of silver with the hope of removing the vesical infection, but after one month's treatment the urine still contained bacilli. He was then discharged, 25th day.

May 10, 1904.—The patient has used intravesical irrigations of boric acid. Urotropin and helmatol internally. Urine passes freely, but still contains numerous bacilli. A catheter passes with ease. Residual urine 150 cc. The cystoscope shows a slight fold of mucous membrane at the vesical orifice in the median portion of the prostate. No prostatic lobes present. At the site of the diverticular orifice is a small scar. With the finger in the rectum and cystoscope in the urethra the amount of tissue is no greater than normal.

May 31, 1904.—Urine is voided freely, a pint at a time. A catheter passes without meeting any obstruction and finds only 5 cc. residual urine.

December 12, 1905.—The patient voids urine freely at intervals of five or six hours. Often does not arise during the night to urinate. There is no incontinence, but occasionally a slight urgency. Erections and power of intercourse have returned. A catheter passes easily, residual urine 30 cc., bladder capacity 550 cc. Urine slightly cloudy, with pus and bacteria.

May 8, 1906.—I void urine naturally at normal intervals, never more than once at night, as much as a pint at a time. I have no pain. Sexual intercourse is not entirely satisfactory, the power does not seem to be as strong. My general health is good and I consider myself cured.

CASE 31.—*Moderate hypertrophy of lateral lobes. No stone. No catheter life. Cure.*

No. 565. R. W. B., age 65, admitted February 26, 1904.

Complaint.—"Frequent and difficult micturition."

He had gonorrhœa at the age of 20, but was thoroughly cured.

The present illness began about five years ago with a sudden complete retention of urine which was relieved by a hot bath, his physician being unable to pass a catheter. For three days he had constant dribbling of urine, but then passed a small calculus and after that the urine came freely. His physician found the prostate enlarged at that time, and since then his symptoms have grown gradually worse. The catheter has only been used three times and always produced considerable hemorrhage. Pain has been very slight, and there has been very little loss of weight. Sexual powers have diminished considerably during the past two years, and he has had no erections for several months. He now urinates every hour during the night and every two hours during the day without hemorrhage and only slight pain.

Examination.—A sturdy looking man with soft arteries and good pulse. The heart, lungs, genitalia and abdomen are negative. The prostate is moderately enlarged, smooth, slightly indurated and uniform in consistence. It is adherent laterally, and tender on pressure. The seminal vesicles are not palpable. A catheter passes with ease and finds 180 cc. residual urine. The bladder is irritable and contracted and will take only 195 cc. of fluid. The cystoscope passed easily, but hemorrhage was produced, making the examination unsatisfactory. Urine acid, cloudy, albumen in considerable amount, no sugar. Microscopically, pus cells, no bacteria.

Preliminary treatment.—Water in abundance, urotropin and catheterization three times daily. 800 cc. was withdrawn at one time.

Operation, March 3, 1904.—Ether. Perineal prostatectomy by the usual technique. Two considerably enlarged lateral lobes were easily enucleated, a small tear being made in the urethra. There was no median lobe present and no calculus. The ejaculatory ducts were preserved.

The wound was closed as usual with double tube drainage and light packs for the lateral cavities. The patient was infused on the table and stood the operation well. Pulse at the end 115. Continous irrigation on return to the ward.

Convalescence.—The patient's pulse was rather weak for several hours after the operation, but was good the next day. The temperature rose to 101° on the day after the operation, and during the next nine days there was an evening temperature generally between 100° and 101° and once reaching 103°, after that it was practically normal. On the third day the patient was stupid and slightly delirious and was infused. The gauze was removed on the third day and the tubes on the fourth day. Urine began to flow through the urethra on the sixth day, and on the 14th day the patient was able to retain urine for four hours. He was discharged from the hospital on the 27th day in excellent condition with a pin-point fistula

in the perineum. An attempt was made to pass a catheter, but obstruction was met with in the region of the membranous urethra. Filiforms were then tried without success. The patient was able to void in a good stream, and there was no evidence of stricture.

April 16, 1904. (Seventh week later).—I have been improving daily. Only a few drops of urine pass through the fistula. I can hold urine for five hours, have no pain, sleep well and have a good appetite.

May 17, 1904.—Letter. I can hold my urine five hours during the day, but void about every two hours at night. The wound is closed and I can empty my bladder. I pass one pint of urine at a time in a large stream and without pain. I have had no erections. My general health is good.

February 1, 1905.—I can void urine normally and am cured. I void urine five times during the night, but only three times during the day and in large amounts, about 330 cc. at a time. I have no pain. Erections have been absent since several months before the operation. My general health is good.

April 5, 1905.—Letter from physician. The patient died a few days ago of pneumonia. During his illness urine contained pus, red blood corpuscles and hyaline casts. His urinary trouble was relieved by the operation.

Pathological report.—The specimen, G. U. 69, consists of the lateral lobes of the prostate, each removed in one piece and weighs in all 26 gm. The right lobe is the larger and measures 5 x 3 x 2 cm., weighs 18 gm., is encapsulated, and on section shows numerous large spheroids with considerable cystic dilatation and moderate amount of stroma. The left lobe weighs 8 gm., and measures 2.5 x 2.3 x 2 cm. It is similar in character to the right, but is firmer and shows few dilated acini. A portion of the floor of the urethra has been removed with the right lateral lobe, but the ejaculatory ducts are not present. No calculi.

Microscopic examination.—The hypertrophy in both lobes is of the glandular type with dilatation of the acini, with numerous intraacinous off-shoots from the peripheral wall and occasional areas of cystic degeneration. The adenomatous tissue is much in excess of the stroma which contains more connective tissue than muscle. A few small areas of prostatitis.

CASE 32.—*Slight enlargement of lateral and median portions. Vesical calculus. Contraction of bladder. Restriction of normal urination. Contraction of bladder persists. Followed two years.*

No. 569. W. P. R., age 64, widower, admitted March 5, 1904.

Complaint.—"Frequency of urination and pain."

Gonorrhœa at the age of 22, no gleet or stricture following.

Present illness began 18 months ago with a slight smarting pain during urination. Two months later his bladder became very irritable and urination frequent. Seven months ago he had hematuria for a week, and since then frequency and pain have been on the increase.

S. P.—Urination is very frequent, at times every half hour. During and

at the end of urination there is a severe pain in the bladder and urethra. His general health is fairly good. His sexual desire has been absent for six months and previous to this he has only occasionally had intercourse.

Examination.—Patient is a pale, rather feeble-looking man. The chest, abdomen and genitalia are negative.

Rectal.—The prostate is very little enlarged, flat, indurated, but smooth. Seminal vesicles are palpable, enlarged and slightly indurated.

Urinalysis.—Cloudy, acid, 1023, considerable albumin, microscopically, pus, epithelium, red-blood corpuscles and bacilli.

Cystoscopic.—The catheter passes with ease and find very little residual urine. The bladder is very irritable, much contracted and holds only 65 cc. The cystoscope shows an irregular, chronically inflamed prostatic margin with a very small rounded median enlargement. The lateral lobes are not at all intravesically enlarged. Just back of the prostatic orifice is a fairly large stone, rough and brownish in color. It was impossible to examine the bladder satisfactorily. With finger in rectum and cystoscope in urethra the median portion of the prostate is slightly increased.

Operation, March 7, 1904.—Ether. Perineal prostatectomy by the usual technique. Lithotomy through the wound. Both lateral lobes were little if at all enlarged, hard, very adherent and difficult to enucleate. The median portion of the prostate was so small that it could not be engaged with the blade of the tractor, but was drawn by the index finger into the left lateral cavity and enucleated there after division of close adhesion to the mucous membrane. The left lateral wall of the urethra was then divided longitudinally, the vesical sphincter dilated, forceps introduced and a calculus 3 x 2 x 1½ cm. in size removed. Double catheter drainage and light packing for the lateral cavities. No suture of the urethral incision, closure of the skin as usual. Continuous irrigation and infusion. Patient stood the operation well. Pulse at end 116.

Convalescence.—The patient had no fever until 11 days after the operation He convalesced well. The continuous irrigation was kept up for 24 hours, the gauze was removed on the second day and the tubes on the third day. The patient was out of bed on the fourth day. The fistula closed on the 11th day. On the 13th day he was able to retain urine for three hours, but passed some blood. On the 14th day there was considerable hemorrhage so that a retention catheter was inserted. Following this he had a chill, temperature reaching 103°. On the 18th day another hemorrhage occurred and the catheter again was inserted. After this he had no further bleeding and left the hospital on the 28th day. At that time the urine was clear, wound closed, general condition of the patient good. Micturition at intervals of about two hours.

April 20, 1904.—Urination is still frequent and examination shows that the bladder only holds 190 cc.

June 1, 1904.—The patient has been treated by hydraulic dilatation of the bladder and its capacity is now 310 cc. Urine is voided in a large stream without difficulty, at intervals of two and one-half hours.

July 9, 1904.—The bladder now contains 390 cc.

September 3, 1904.—A catheter passes with ease and finds no residual urine. The bladder capacity is 300 cc. He has used no intravesical irrigations or dilatations for several months. He is advised to begin again.

February 1, 1905.—I void urine naturally five or six times during the day and three or four times during the night without pain. I am cured, but have had no erections. This disturbs me greatly.

March 20, 1905.—A fine opportunity was afforded, and I found that my sexual powers were as good as ever. My youth has been renewed. I now believe in prostatectomy.

February 17, 1906.—Letter. I void urine naturally, but quite often, owing to contracture of the bladder. I generally urinate four or five times during the night, but I have no pain and sometimes pass a glass full of urine at a time. I have erections occasionally and have had very satisfactory sexual intercourse. I have not continued to dilate my bladder as you suggested. My general health is very good, and I have gained many pounds in weight.

Pathological report.—The specimen, G. U. 72, consists of three pieces representing the lateral and median portions of the prostate, and weighs in all about 8 gm. The right lateral lobe measures 2.5 x 2 x 2 cm., is somewhat irregular, but fairly smooth, and on section shows gland tissue with considerable intervening stroma, some dilated ducts, no spheroids and a fairly thick capsule. The left lobe is smaller than the right, measuring only 2 x 2 x 1.3 cm., but is similar to the right in character. The median bar is a small bit of tissue 1.5 x .8 x .6 cm. in size, and seems quite fibrous. No mucous membrane, no ejaculatory duct removed. An oval calculus about 3 x 2 x 1.5 cm. in size is present.

Microscopic examination.—In both lateral lobes the hypertrophy is a richly glandular one, the stroma being comparatively small in amount. The acini are moderately dilated and in areas show cystic dilatation. There are the usual intra-acinous projections which in places assume a papillomatous type. There is present quite a marked prostatitis with numerous pus cells in the lumina of the ducts, and quite marked epithelial proliferation and desquamation. The stroma contains considerably more connective tissue than muscle, and there is quite extensive round cell and polynuclear cell infiltration with some areas of chronic inflammatory tissue formation. In the middle bar the glandular element is very much exceeded by the stroma. The acini are filled with proliferating and desquamated epithelial cells. The microscopic picture seems to differ from the normal only in the fact that there is present quite a marked prostatitis.

CASE 33.—*Small pedunculated median lobe. Vesical calculus. Contracted bladder. Catheter life. Result: Normal urination. Frequency and pain owing to contraction, possibly calculus. Lived one year after operation. Death: Cause? No autopsy.*

No. 582. G. R. B., age 77, married. Seen in Rochester, New York, March 11, 1904.

Complaint.—"Difficulty, frequency and painful urination."

No history of gonorrhœa or previous urinary trouble. Present illness began six years ago with slight difficulty and frequency of urination which increased gradually until he began the use of a catheter two years ago. Since then he has been unable to void urine naturally, and he now has to use a catheter every hour. He suffers considerably from pain at the end of urination.

Examination.—The patient is a very weak-looking man. He is pale and pulse is poor. Chest and abdomen negative. The prostate is only slightly hypertrophied, considerably indurated and tender. A catheter passes with ease. Retention of urine is complete. Bladder capacity small and bladder very irritable. The cystoscope shows a small pedunculated median lobe, a slight intravesical hypertrophy of both lateral lobes, and a vesical calculus of medium size.

Operation, March 11, 1904.—Spinal anesthesia with cocaine grains ⅓. Prostatectomy by the usual technique. The lateral lobes were only slightly enlarged. It was impossible to engage the middle lobe with the tractor or with the finger. As the urethra had to be dilated to remove the calculus, it was thought best to remove it through the dilated prostatic urethra, which was done by means of a clamp. It proved to be about 3 cm. long and 2 cm. in diameter. A stone 3 x 4 x 2 cm. in size was then removed through the urethra. The urethra and ejaculatory ducts were preserved intact. The usual closure was employed with double drainage tubes for the bladder. Patient did not suffer pain in the operation upon the prostate and his condition at the end was good. Continuous irrigation and a submammary infusion of salt solution were given on return to the room.

Convalescence.—The patient reacted well. The tubes and gauze were removed on the third day. No complications.

Letter from Dr. Howard, June 5, 1904.—The patient looks very well. The fistula has closed and he urinates freely. He walks about the ward and has a normal pulse and temperature. Sounds are passed occasionally. The patient urinates every half an hour night and day, but the stream is large, and he thinks he can empty his bladder. His chief complaint is severe pain just back of the glans penis. He has no erections, but these were absent before operation.

Letter, February 1, 1905.—I void every hour and about two ounces at a time. Pain is almost continually present in the penis. I do not use a catheter. I am physically very weak on account of the severe pain and frequency of urination.

Note.—His physicians reported that there was no residual urine present and no stone, but the bladder was markedly contracted and markedly inflamed. They were advised to try dilatation of the bladder by hydraulic pressure, but apparently very little success attended their efforts, and patient died in the spring of 1905. No autopsy was obtained, but the obstruction to urination had apparently been completely removed.

Pathological report.—Specimen G. U. 97. The hypertrophy consists about equally of gland tissue and stroma, the relative amounts varying in different areas. There seems but slight tendency to form spherical lobules.

Microscopic examination.—The acini, as a rule, do not show the complexity which one sees in more glandular prostates. They are, however, for the most part dilated, and here and there show small cystic formation. The stroma is rather compact, and contains more connective tissue than muscle. There are quite numerous areas of interstitial round cell and polynuclear cell infiltration.

CASE 34.—*Slight enlargement of median and lateral lobes. 200 cc. residuum. Diabetes mellitus. Complication: rectal necrosis, fistula. Secondary closure of rectum. Cure. Followed 26 months.*

No. 581. J. K., age 65, married. Operated upon in Rochester, N. Y., March 11, 1904.

Complaint.—"Difficulty and frequency of urination."

No history of gonorrhœa.

Present illness began 10 years ago with slight difficulty of urination. Since then there has been a gradual increase in the difficulty and frequency of micturition. He was catheterized first seven months ago and since then has used the instrument at least once daily, but has not had complete retention of urine.

S. P.—The patient catheterizes himself twice daily. After four or five hours he begins to void, the interval being every two hours until catheterized again. He has very little pain and his general health is good. Sexual powers are weakened. Erections are present occasionally and intercourse possible, but ejaculations are very premature.

Examination.—The patient looks well, his lips are of good color, and the arteries are only slightly thickened. Chest, abdomen and genitalia negative.

Rectal.—The prostate is slightly enlarged, does not bulge into the rectum, is smooth, but distinctly hard. The seminal vesicles are negative.

Cystoscopic examination was not made. A coudè catheter passes with ease and finds 200 cc. residual urine.

Urinalysis.—Cloudy, acid, sp. gr. 1025, no albumin. Sugar in small but definite amount.

Note.—In view of the presence of sugar the operator would have put the patient upon anti-diabetic treatment before performing prostatectomy had the patient been in Baltimore. His general condition, however, was excellent, there were no symptoms of diabetes and his physician considered the disease of slight import. Operation was therefore agreed to.

Operation, March 11, 1904.—Chloroform. Perineal prostatectomy by the usual technique. The lateral lobes are very little larger than normal and quite adherent in the deeper portion, but were fairly easily enucleated each in one piece. The middle lobe could not be engaged with the blade of the tractor and that instrument was withdrawn. With a finger in the urethra a small pedunculated median lobe was pushed into the left lateral cavity and there enucleated without removing any of the mucous membrane covering it. The middle lobe measured 1 x 1 x .5 cm. in size. The ejaculatory

ducts were preserved and only one small tear was made in the urethra. The wound was closed with double tube drainage and light packs for the lateral cavities. Examination of the posterior portion of the wound with the finger showed that no tear had been made in the rectum (but the levators were not drawn together as is now done). The patient stood the operation well. Continuous irrigation and infusion on return to room. Instructions were given to start the gauze on the next day, to remove them on the third day and the tubes on the fourth day. The operator left Rochester five hours after the operation.

Convalescence.—Complete notes not obtained. When the tubes were removed on the fourth day a rectal fistula was discovered.

March 25, 1904.—Letter. The patient is doing well, and the fistula is smaller, but there is quite a hole in the rectal wall just above the sphincter. The urine escapes through the perineum, but no feces or gas escape through the urethra. The wound looks well.

On April 7 an incision was made in the bulbous urethra and a rubber catheter inserted through it into the bladder for continuous drainage. It was removed after 12 days, and for one week there was no escape of urine through the original perineal wound, and the rectal fistula was greatly contracted.

May 1, 1904.—The perineal fistula has opened again, but it is very small and does not leak until the bladder becomes distended. He voids urine every three hours and has no dribbling.

October 6, 1904.—The patient presents himself for examination in Baltimore. He voids urine at normal intervals, arising only once during the night. There is no difficulty in urination, but the urine escapes partly through the penis, through the rectum and through the perineal fistula. Gas escapes through the urethra, but never any fecal matter. He has been on anti-diabetic diet for four months and his urine has been free from sugar. His general health is good.

Examination.—At the apex of the perineal incision is a small urinary sinus. With finger in rectum a small rectal fistula is found just above the sphincter ani. The outlines of the prostate cannot be made out. The urine is acid, slightly purulent and contains 2% sugar.

Preliminary treatment.—The urine contained very little sugar, the sp. gr. from 1020 to 1027. The patient was kept on anti-diabetic diet for 12 days previous to operation. The specific gravity varied from 1015 to 1020, there was no sugar or acetone present. For two days previous to the operation bicarbonate of soda, grains 15, was given every four hours.

Operation, October 18, 1904.—Ether. Suprapubic cystotomy for drainage. Closure of rectal and urethral fistula through perineal incision. A very small suprapubic incision was made. The finger showed a normal prostatic orifice and no foreign body. A large drainage tube was inserted, and the bladder closed round it. The patient was then placed in the lithotomy position, and a probe passed through the fistula into the rectum and another into the urethra. Incisions were then made in the old scar and

the fistulæ excised. The urethral opening was found to be about 1 cm. long, that into the rectum was smaller. After excising all cicatricial tissue the rectal opening was closed with a double layer of mattress sutures of fine silk. The urethral opening, which was found to be in the membranous urethra, was similarly closed. The levator ani muscles were drawn together over the rectum with interrupted sutures of catgut. The wound was lightly packed and partially closed with interrupted sutures of catgut. The patient was infused on the table and stood the operation well. Pulse at the end 95.

Convalescence.—The patient reacted well. On the day after the operation he was given an infusion 1000 cc. salt solution containing 40 grains of bicarbonate of soda. After that he received 30 grains of bicarbonate of soda every four hours and a lead and opium pill, and morphia in small amounts for seven days. The gauze was removed on the 4th day. There had been no escape of urine, all of which came through the suprapubic tube. The bowels were not moved until the 13th day, after he had received castor oil and Rochelle salts by mouth and high retained oil enema. The patient had been fairly comfortable up to the 12th day when he began to complain of pain. Some fecal matter came through the perineal wound and after that there was also an escape of urine through the perineum. The suprapubic drainage tube was not removed, and after nine days there was no further escape of feces or urine through the perineum, and the perineal wound healed by granulation. The suprapubic tube, however, was not removed until the 38th day. The patient left the hospital on the 55th day. At that time patient voided naturally, without pain. Rectal examination showed the closure of the rectal fistula, the suprapubic and perineal wounds were also closed. Silver catheter passed with ease, there was no residual urine present, no stone, the bladder was contracted, but its exact size not determined. Urine was clear, acid, contained no sugar, but pus cells and bacilli in moderate number. The patient has been eating meat, eggs. onions, cabbage, and asparagus.

February 1, 1905.—Letter. I void urine naturally at intervals of three hours, have no pain and consider myself cured. I have had no erections.

November 30, 1905.—I void urine once at night and about every two hours in the day, suffer no pain. I have erections at times, but have not had intercourse. The wounds have remained closed. My general health is excellent and I have gained in weight.

May 10, 1906.—Letter. I void urine naturally at regular intervals, arise about once at night to urinate. Have no pain, no erections. My general health is good, I have gained in weight. The wounds have remained closed, and I consider myself cured.

Pathological report.—The specimen, G. U. 71, consists of three lobes of the prostate each removed in one piece, and weighs in all about 10 gm. The median lobe is somewhat pear-shaped, and measures 1.2 x 1 x1.5 cm. One lateral lobe measures 2.5 x 2.5 x 1.5 cm. and the other about 2 cm. in diameter. Each of the lobes is globular in shape, encapsulated,

and on section is fairly homogeneous with very little stroma in places; in other places it is more pronounced with spheroid formation. No areas of induration. No mucous membrane has been removed. The ejaculatory ducts are not present.

Microscopic examination.—The gland tissue is very much in excess of the stroma and for the most part arranged in lobules. The acini are for the most part considerably dilated with occasional cystic degeneration of an acinus. The acini show the usual complexity and proliferation. The stroma is compact, the connective tissue being slightly in excess of the muscle. Some corpora amylacea are seen. A few small areas of prostatitis are present. The hypertrophy is of the same type in all three lobes.

Case 35.—*Moderate hypertrophy of median and lateral lobes. Cured.*

No. 585. S. S., age 72, married, admitted March 21, 1904.

Complaint.—"Difficulty of urination. Catheterism."

No history of gonorrhœa.

Present illness began four years ago with difficulty and frequency of urination which gradually increased until two years ago when complete retention of urine set in and patient had to be catheterized. For the next six months the catheter was used four or five times during the day. After that for a time he voided naturally, but during the past 18 months the catheter has been necessary.

S. P.—The patient uses the catheter five times in 24 hours, retention of urine being complete. He secretes about 10 pints of urine in 24 hours, and usually finds two pints each time with the catheter. He has not suffered pain nor hematuria and his general health has been good. Erections present, sexual powers normal.

Examination.—The patient is a sturdy-looking man. Lips and mucous membranes of good color. Both lungs are emphysematous. The heart is difficult to outline, but the sounds are clear, though the rhythm is exceedingly irregular.

Rectal examination.—The prostate is moderately hypertrophied, rounded, smooth, elastic, soft. The seminal vesicles cannot be reached.

Cystoscopic examination.—A large coudè catheter passes with ease. The bladder capacity is large, retention of urine is complete. The cystoscope encounters hemorrhage, making the examination unsatisfactory. The presence of a fairly large middle lobe and slight bilateral intravesical hypertrophy is made out. It is impossible to examine the bladder satisfactorily.

Urinalysis.—Sp. gr. 1012, acid, albumin a trace, microscopically, pus and bacteria.

Operation, March 22, 1904.—Ether. Perineal prostatectomy by the usual technique. The patient was a very large man and the perineum very thick and the prostate deep. Each lateral lobe was removed in two pieces. The middle lobe was drawn by the tractor into the left lateral cavity and enucleated without removing any mucous membrane. Examination with the

finger in the urethra showed no remaining hypertrophied tissue. The urethra was torn, but no mucous membrane was removed and the floor and ejaculatory ducts were preserved intact. An infusion was given on the table, the wound was closed as usual with double tube drainage and light packs for the lateral cavities. Condition at the end of the operation was excellent, pulse being 95. Continuous vesical irrigation was instituted on return to ward.

Convalescence.—The patient reacted well, highest temperature was 100° on the day following the operation, and after that it was practically normal. The gauze was removed on the second day, and the tubes on the third day. There was fairly considerable bleeding for 24 hours after the operation and the patient was infused a second time. Pulse did not rise above 100, however. Urine passed through the urethra on the ninth day, interval urination having been present for several days. The patient was up in a chair during the first week. He was discharged April 18 (27th day). He has not had instrumentation. His condition was excellent, could retain urine for three or four hours and only a small amount came through the fistula which was not yet closed. There had been no complications.

May 20, 1904.—Letter. I urinate every hour during the day and five times at night. There is no fistula. I void half a pint at a time and feel that I can empty my bladder. Urination is satisfactory, I have no pain and I have not used a catheter. Urine is very foul. I have not had erections. My general health is fairly good.

Pathological report.—The specimen, G. U. 75, consists of the lateral and median lobes of the prostate removed in six pieces, and weighing in all 25 gm. The right lobe is composed of two pieces, the left of three pieces, and the median of one piece. All of the lobes are composed of large spheroids, loosely bound together. On section numerous small and enlarged spheroids are seen. The median lobe measures 2 x 2 x 1.5 cm., and consists of a globular mass about 1.5 cm. in diameter upon a flat base. The consistence is everywhere elastic, and the section shows numerous dilated acini. No calculi and no areas suggesting malignancy are present.

Microscopic examination.—The hypertrophy is a glandular one with areas of considerable cystic dilatation and areas of rather marked glandular proliferation. The stroma is formed mostly of fairly cellular connective tissue, although here and there is some embryonic tissue. The muscle is quite insignificant in amount. Some endoglandular prostatitis is present, with occasional infiltration of the periacinous stroma. The blood vessels show only slight thickening.

Case 36.—*Moderate enlargement of lateral lobes of prostate. Residual urine 10 cc. Bladder contracted, capacity 50. Vesical calculus. Cured. Followed two years.*

No. 106. J. W. L., age 72, married, admitted March 29, 1904.

Complaint.—"Frequent and painful urination."

No history of gonorrhœa.

Present illness began about five years ago with increased frequency of urination. Shortly afterwards he passed a small calculus, and during the next six months 20 more calculi. In November, 1899, he came to the hospital complaining of painful and frequent urination which occurred at least four times every night, and often every 15 minutes.

Examination showed a slightly enlarged prostate, but the catheter showed no residual urine. The bladder was irritable and held only 100 cc. He was carefully searched with a metal searcher, but no calculus was detected. Several days later the cystoscope showed a large oval calculus in a pouch back of the interureteral ligament. On December 24, 1899, lithotapaxy was performed under chloroform anesthesia. Considerable difficulty was experienced in catching the fragments with the lithotrite and the operation required one hour and a half.

January 15, 1901.—The patient has reacted well, voids urine without pain, at intervals of every two hours. He is discharged.

March 29, 1904.—Eighteen months ago the patient began again to pass gravel. He now voids every hour in the night and every 15 minutes in the day. The stream is slow, and small, but he suffers no pain, no hematuria. He has had no erections for four years, his general health is good.

Examination.—Patient is well nourished, lips of good color. Heart, lungs and abdomen are negative. There is slight arterio-sclerosis.

Rectal.—The prostate is considerably enlarged in both lateral lobes. The median furrow is deep and wide, and the notch is deep. The surface is smooth, consistence soft, no tenderness. The seminal vesicles cannot be felt.

Urinalysis.—Cloudy, acid, sp. gr. 1018, no sugar, albumin slight, microscopically, pus cells and bacilli.

Cystoscopic.—A coudè catheter passes easily, residual urine 10 cc., bladder capacity 50 cc. The lateral lobes of the prostate are moderately hypertrophied, there is a deep cleft between them in front and behind. Resting on top of the two lateral lobes, with the cystoscope looking upward, two stones are seen, as shown in A. In series U, when the handle of the cystoscope is depressed the anterior cleft becomes shallow and the calculi occupy the larger part of the field. When the handle of the cystoscope is elevated the calculi disappear from view and the anterior cleft becomes quite deep (2 and 3). In series D, with the handle depressed a deep cleft is seen posteriorly. On gradually elevating the handle of the cystoscope the lateral lobes are gradually separated and a median fold of mucous membrane appears and finally in 4 is the only thing seen at the prostatic margin. Examination of the bladder was unsatisfactory. With finger in rectum and cystoscope in urethra there was very little increase in the median portion of the prostate.

Operation, March 4, 1904.—Ether. Perineal prostatectomy by the usual technique. Removal of two calculi through wound. The lateral lobes were removed each in two pieces. After removal of the first piece on each side it seemed that all of the hypertrophied tissue had been removed.

Careful examination, however, revealed an intravesical lobule higher up on each side, the blades of the tractor having slipped beneath them at the beginning when traction was made. By pushing the tractor further into the bladder, depressing and rotating the handle, it was possible to draw down and enucleate these intravesical enlargements without tearing the urethra or the bladder. The median portion of the prostate was not removed, being very little hypertrophied. The tractor was then removed and the left lateral wall of the urethra divided longitudinally with scissors. The bladder orifice was dilated with a uterine dilator, a stone forceps inserted and two calculi easily extracted. The finger was inserted and showed a very small bladder and no remaining prostatic enlargement. The wound was closed as usual with double drainage tubes, and light gauze packs for the lateral cavities. Infusion and continuous irrigation. Patient stood the operation well, his pulse at the end being 90.

Convalescence.—The highest temperature was 100.8° on the second day, after the third day it was practically normal. Continuous irrigation was kept up for 24 hours. The gauze was removed on the third and the tubes on the fourth day. The patient was out of bed on the sixth day. Urine came through the urethra on the eighth day and the perineal fistula closed on the eleventh day. There was scarcely any incontinence after the opera tion, and the patient was discharged on the 20th day, voiding urine in a large stream, every three hours during the day and with perfect control.

May 20, 1904.—I void urine at intervals of three hours during the day, and four and one-half at night, half a pint at a time. The wound is closed and I feel well.

February 1, 1905.—Letter. I void urine naturally, three or four times during the day and twice at night. I have no pain, no erections.

November 30, 1905.—Letter. I urinate three or four times during the day and twice at night. Half a pint at a time. Occasionally partial erections occur, not sufficient for intercourse. My health is excellent and I consider myself cured.

May 7, 1906.—Letter. I void naturally from four to six times a day, and once or twice at night when I drink much water. The largest amount voided at one time is about one-third of a pint. I have no pain, no erections. I have had no complications, and my general health is good. I have gained in weight and consider myself cured.

Pathological report.—The specimen, G. U. 76, consists of the two lateral lobes of the prostate, each removed in two pieces, and weighing in all 21 gm. The surfaces of the specimens are irregularly lobulated and of uniform consistency. On section numerous spheroids are seen, but very few dilated ducts, the consistence being more homogeneous than usual. The right lateral lobe weighs 11 gm., and measures 4.5 x 2.5 x 2 cm. The left lobe weighs 10 gm. and measures 5 x 3 x 2 cm. Two smooth white calculi measuring each about 2.5 cm. in diameter have been removed.

Microscopic examination.—The hypertrophy is of a rather glandular appearance with arrangement in lobules and there is condensation of the

perilobular tissue. The tissue presents nothing but the usual glandular hypertrophy except that there is quite extensive prostatitis present, with glandular proliferation and degeneration of the epithelial cells, and fairly extensive round cell and polynuclear cell infiltration of the stroma and the formation of some chronic inflammatory tissue. In many of the ducts quite numerous pus cells are present.

CASE 37.—*Small hard prostate. Slight median enlargement. Multiple vesical septa and diverticula. Operation. Cure. Contracture of bladder, relieved by hydraulic dilatation.*

No. 591. W. B. E., age 47, married, admitted March 31, 1904.

Complaint.—" Irritable bladder."

The patient had gonorrhœa at the age of 18 and following it gleet and stricture.

Was married at the age of 27 and his wife had no children.

Present illness began 12 years ago with frequency and difficulty of urination and pain in the back. Four months later an encysted calculus was removed by Dr. Fenger of Chicago through a suprapubic incision. The suprapubic sinus did not heal for five months, but after that the patient was free from symptoms for six months. Another calculus was then found and removed by litholapaxy and the patient remained well for three years. He was then catheterized and five ounces of residual urine discovered. For three weeks his bladder was irrigated through a catheter with much improvement. After that he was treated by various men, and at times was quite well, and at others had considerable difficulty and frequency of urination. For the past two years he has been unable to work. Has treated himself off and on with intravesical irrigations through the catheter, usually finding three ounces of residual urine and a contracted bladder. For the past three months the patient has catheterized himself regularly at bed time, generally withdrawing seven ounces of residual urine, and in this way has been able to sleep four or five hours before arising to urinate. Urination is difficult and he often has to strain. He voids about every hour, but has no pain except when urination is particularly difficult. His general health is good. His sexual powers are normal with the exception that ejaculation is somewhat precocious.

Examination.—The patient is a healthy looking man with lips of good color. The heart and lungs are negative. Abdomen negative with the exception of an old suprapubic scar.

Rectal examination.—The prostate is slightly enlarged. The consistence is quite hard, particularly the right lateral lobe which is very hard, the surface is smooth and there are no nodules. The seminal vesicles are not palpable, and there is no induration in this region. A catheter passes with ease and finds 180 cc. residual urine. Bladder capacity is about 300 cc. The cystoscope shows a slight hypertrophy of the left lateral and median portions of the prostate with a deep cleft between. Th right lateral lobe is not enlarged and there is no cleft between the lateral lobes in front. The trigone is drawn behind the median bar so that it is impossible to

see the ureters. The bladder is markedly inflamed, trabeculated and several prominent irregular septa are present, and between these, deep pouches and three diverticula with large orifices are seen. The diverticula occupy the two lateral walls of the bladder, and there is apparently no danger of constriction of the orifices or of pressure upon the ureters. With the finger in the rectum and cystoscope in the urethra a definite increase in the median portion is found.

Urinalysis.—Very cloudy, acid, albumin in small amount, no sugar. Microscopically, pus in considerable amount.

Note.—The patient was treated by catheterization and intravesical irrigation, prostatic massage and urethral dilatation from March 31 to April 19. Under this treatment the bladder became less irritable, but the amount of residual urine increased, at least 400 cc. being present. Perineal prostatectomy was decided upon, although there was very little enlargement present.

Operation, April 19, 1904.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were very small, weighing about 7 gm. each. The median enlargement was even smaller, and was removed with the assistance of a finger in the urethra through the right lateral cavity. No other enlargement was present. Examination of the bladder with the finger showed a broad shallow pouch behind the interureteral ligament, behind which there was a transverse septum; the diverticula were out of reach. The ejaculatory ducts, urethra and bladder were preserved intact. The lateral cavities were packed with gauze, double tube drainage for the bladder through the perineum was supplied and the wound closed as usual. There was very little hemorrhage and the patient's condition was excellent.

Convalescence.—The patient reacted well. The gauze was removed on the fifth and the tubes on the sixth day. He was walking on the ninth day and on the thirteenth began to void through the penis. On the sixteenth day the perineal wound did not leak for a day. Temperature rose to 100.6° on the day after the operation, but after that it was practically normal.

May 7, 1904.—The perineal wound is still open. The patient has not been instrumented since the operation. He voids his urine about every three and one-half hours. Has no dribbling and no pain. Is discharged from the hospital to-day (18th day).

June 1, 1904.—Small urinary fistula is still present in the perineum. Examination shows that it is extremely small and will not admit a probe. The small fistula gimlet can be screwed in with ease, and by this means the fistula is thoroughly curetted.

June 7, 1904.—The fistula closed at once after the curettement with the gimlet and there has been no leakage for a week. The patient is drinking large amounts of water and is voiding 325 cc. of urine at a time. The stream is large and urination is entirely satisfactory. Erections have returned. A catheter passes with ease and finds 100 cc. residual urine. The bladder is slightly contracted. The patient is discharged.

Note.—The residual urine in this case is probably due to the diverticula which have not the muscular power to empty themselves, but can be drained by a catheter.

June 28, 1904.—I am feeling well, but the wound broke open on the way home.

November 17, 1904.—My wound is completely healed, it closed two months ago. I have gained 30 pounds in weight. My urine is still quite cloudy and I am troubled sometimes with frequency of urination.

February 1, 1905.—I can void urine normally, and consider myself cured. I have not used a catheter or sound since the operation. I suffer no pain. Erections have returned and intercourse is normal. I urinate three times during the night and five times during the day. My general health is excellent.

November 30, 1905.—I void urine naturally and consider myself cured. I do not arise at all at night to urinate as a rule, but sometimes once. I void about 250 cc. at a time. Suffer no pain. Erections and intercourse are normal. My fistula is closed and I have complete control.

February 27, 1906.—The patient returns for examination. He has had no treatment since his discharge, and has not required catheterization. He has been able to void without difficulty or pain, but there has been a gradual shortening of the interval between urinations, and he now arises four or five times at night to urinate, and voids every two hours during the day. He has perfect control, and no dribbling at the end of urination.

Sexual powers.—Erections and intercourse are normal. (Just as strong as before operation.) The patient looks well, and the wound is firmly closed. Rectal examination is negative. The urine is acid, very cloudy, sp. gr. 1011, and contains albumin in considerable amount, and bacilli and pus cells.

Cystoscopic.—A silver catheter passes with ease and finds only 30 cc. residual urine. The bladder is contracted and admits only 150 cc. of fluid. (The patient is able to retain, however, over 200 cc. of urine.) There is no stricture present. The cystoscope shows no enlargement of the lateral lobes and no sulci between them. There is a slight, thin, but definitely elevated median fold or bar with a slight pouch behind it. Study of the bladder shows that the diverticula are still present, but apparently much smaller than before operation. The broad transverse ridge on the posterior wall with a pouch in front and with two diverticula on each side is seen. With finger in rectum and cystoscope in urethra the beak is easily felt, and there is no increase of the median portion of the prostate made out. The lateral lobes are much smaller.

March 17, 1906.—The patient has been treated for three weeks, the bladder being dilated twice daily by hydraulic pressure. The Kollmann dilator has been used about 10 times, although no stricture has been detected, and it has been easy to dilate the urethra up to No. 37-F. The bladder has gradually enlarged by hydraulic dilatations. At first it was possible to get in only about 150 cc. and the amount voided was never over 125 cc. The

patient is now able to void 325 cc. at one time, and urinates only about twice at night, and at intervals of four hours during the day. A catheter finds 30 cc. residual urine. Urine is still quite cloudy and contains pus and bacteria. Patient is discharged and advised to continue irrigations.

Remark.—This case is a good example of markedly increased frequency of urination due to vesical contraction.

May 8, 1906.—Letter. I void urine naturally about six times during the day and twice at night, about eight ounces at a time. I have erections and satisfactory sexual intercourse. My general health is excellent, and I consider myself cured.

CASE 38.—*Considerable enlargement of median and less of lateral lobes. Catheterism. Pain, double epididymitis. Operation. Cure. Followed 18 months.*

No. 613. G. T. C., age 65, married, admitted April 28, 1904.

Complaint.—" Difficulty of urination and catheterism."

The patient had gonorrhœa at the age of 19; a light attack of which was easily cured, without subsequent stricture or gleet.

Present illness began about 10 years ago when he noticed for the first time a slight difficulty in urination. After that there was a slow but gradual increase in the difficulty and frequency, but he did not have complete retention until two years ago. He did not require the catheter again until one month ago, and since then has used it from two to five times every day, but occasionally has been able to void small amounts. Ten days ago both testicles became swollen. He still has erections, but his sexual powers are somewhat weakened.

Examination.—The patient is a sturdy looking man with only slight arteriosclerosis. A marked aortic stenosis is present. Each epididymis is indurated and enlarged. On rectal examination the prostate is found markedly enlarged, being about the size of a medium-sized orange, smooth, elastic and soft, regular in contour with no nodules nor induration. The median furrow is shallow and the notch is replaced by a prominence, the upper end of which can just be reached. The seminal vesicles can not be palpated. Urine acid, cloudy, and contains albumin, pus and epithelial cells, and numerous bacilli.

Cystoscopic examination.—A coudè catheter passes with ease and finds 100 cc. residual urine (patient says he usually finds 500 cc.). The cystoscope shows a large median lobe with a deep sulcus on each side of it. The lateral lobes do not project far into the bladder, and there is no cleft between them in front. The bladder wall is considerably trabeculated and numerous pouches are seen. With the finger in the rectum and cystoscope in the urethra the beak could not be felt and the mass between the two was considerable.

Preliminary treatment.—Frequent catheterization. Large amounts of water and urotropin by mouth.

Operation, May 6, 1904.—Ether. Perineal prostatectomy by the usual technique. The prostate was enucleated in four pieces, the two lateral lobes each in one piece, and the median lobe in two pieces, one-half through each lateral cavity. The urethra, ejaculatory ducts and bladder were preserved intact. There was only a moderate amount of hemorrhage. The wound was closed as usual with gauze packing for the lateral cavities and double drainage tube for the bladder. Submammary infusion was given on the table and a continuous irrigation for the bladder was given for about 48 hours after the operation.

Convalescence.—The patient stood the operation well. The gauze was pulled out on the third day and the tubes on the fourth. The fistula closed three weeks after the operation, and the patient went home on the twenty-sixth day. Highest temperature 101.6° on the fourth day.

June 5, 1904.—The patient voids at intervals of from four to six hours. He has no incontinence, and urination is normal. Erections have returned.

June 29, 1904.—The patient reports urination normal. Sexual desire and erections have returned.

September 22, 1904.—The patient goes to bed at 9 o'clock, arises to urinate at 9 a. m.

November 30, 1905.—Urination is normal and the patient is able to retain urine for from six to nine hours. He has had no instrumentation since operation and voids urine in a large stream. Erections are the same as before operation and intercourse is indulged in. Has had no complication since operation.

Pathological report.—The specimen, G. U. 285, consists of five pieces of prostatic tissue representing the two lateral and the median lobe. Total weight about 25 gm. The tissue is lobulated, consistency firm, but elastic. On section the tissue is composed of spheroids in varying sizes with moderate-sized interlacing bands of denser tissue. The ejaculatory ducts have not been removed. No calculus.

Microscopic examination.—The hypertrophy is a lobulated moderately glandular one in which the usual picture is greatly modified by inflammatory changes. Over extensive areas the acini are small, separated by considerable bands of stroma, and about the acini there is concentrically arranged considerable fibrous tissue. The gland ducts are filled with pus cells, and degenerated and desquamated epithelial cells. In some lobules where the prostatitis is absent or small in amount the gland acini are moderately dilated with serrated margin and lined by tall cylindrical epithelium. The stroma is about equal in amount to the gland tissue, and it contains considerable excess of connective over muscle tissue. There is considerable inflammatory infiltration, and there has been considerable inflammatory hypoplasia. The microscopic picture has been much modified by the extensive prostatitis. The blood vessels for the most part seem practically normal.

CASE 39.—*Small round median lobe. No lateral enlargement. Residual urine 470 cc. Rectal fistula after operation. Closure at third operation. Cure. Followed two years.*

No. 630. S. M. G., age 62, widowed, admitted May 21, 1904.

Complaint.—"Difficulty in urination. Catheterism."

No history of gonorrhœa.

Present illness began about eight years ago with slowness in starting urination. After voiding a small amount there would be a sudden stoppage accompanied by pain, but after a little while he would be able to void again. The difficulty and frequency of urination gradually increased and two years ago the difficulty was intense. In March, 1903, the patient had a severe attack of la grippe, and after that the difficulty of urination and frequency of urination were very great for two or three months. Then he began to improve and by November, 1903, he was able to void urine without pain at intervals of from six to eight hours. A month later, however, after a severe chill, urinary trouble again became very distressing, urination being very frequent, difficult and painful. About January 15, 1904, he was catheterized by his physician and 14 ounces residual urine obtained. Since then he has used the catheter about four times a day. Under this treatment he has improved considerably.

S. P.—At present the patient uses the catheter night and morning. After catheterization he does not void for three hours, but thenceforth voids every hour or two until catheterized again. Urination is difficult, and he suffers pain which is located in the neck of the bladder, and is worse at the end of urination.

Sexual powers.—Erections are present, but he has not had intercourse for 12 years.

Examination.—The patient is a well nourished man with lips of good color. Heart, lungs and abdomen are negative. Genitalia negative.

Rectal examination.—The prostate appears only slightly enlarged, left lobe being a little larger than the right. It is smooth, generally indurated, but not of stony hardness. No nodules are to be felt, and the seminal vesicles are soft. Urine cloudy, acid, sp. gr. 1010; trace of albumin, no sugar. Microscopically, pus cells and bacilli. Prostatic secretion contains many pus cells, few normal elements and no spermatozoa.

Cystoscopic examination.—A catheter passes with ease and finds 470 cc. residual urine. The cystoscope shows a small median lobe with a shallow sulcus on each side, the lateral lobes are not intravesically hypertrophied and there are no clefts between them in front. The bladder is markedly trabeculated, showing numerous small cellules and deep pouches. There is no foreign body and a cystitis of moderate degree is present. With finger in rectum and cystoscope in urethra the beak can be easily felt, and the tissue in the median portion of the prostate seems only moderately thickened.

Operation, May 31, 1904.—Ether. Perineal prostatectomy by the usual technique with the exception that the rectum was not examined and the levators were not approximated. The lateral lobes were only slightly enlarged, very adherent to the capsule and urethra, but were successfully removed each in one piece without injury of the mucous membrane or bladder. Attempt was made to engage the median lobe with one blade of the tractor, but owing to its small size it was impossible, the tractor was then withdrawn and after dilatation of the urethra with a glove stretcher, the index finger of the left hand was inserted, and a very small, slightly rounded median lobe was found and carried with difficulty by the finger towards the left lateral cavity where it was removed with blunt and sharp periosteal elevators. A small bit of mucous membrane which covered its vesical surface was removed, but the urethra and ejaculatory ducts were left intact. The wound was closed with double drainage tubes for the bladder; lateral cavities packed with gauze. It was not the custom then to examine the rectum at the end of the operation nor to approximate the levator muscles and neither of these was done, otherwise the closure was as usual. There was only a moderate amount of hemorrhage and the patient stood the operation well. Continuous irrigation and submammary infusions were both given on the table.

Convalescence.—The patient reacted well. Pulse at end of operation 70. Temperature on night following operation 98.4°. Continuous irrigation was discontinued after five hours, and the second day after the operation his temperature arose to 108.8°. The patient complained of a severe pain in the head and the abdomen. He was given an enema at 6 p. m. and shortly afterwards complained of severe pain in the wound. On the third day he continued to have pain in the abdomen and the wound and received codeia several times and calomel. His temperature was 104.4°. All gauze was removed on the third day (no evidence of fecal fistula then).

June 3.—Fourth day. The patient had a large fluid stool to-day, there was a considerable discharge of feces from the wound when the bowels moved. The patient still complains of pain in the wound. The drainage tubes were removed to-day. At 9 p. m. the patient received a large enema through a rectal tube and had a large fluid stool, but continued to suffer a severe pain in the wound.

June 9, 1904.—His general condition is improving, and the patient is on his feet every day. He has had several stools and is more comfortable. The urine still escapes through the perineum.

June 11, 1904.—Night before last after an enema given with a large rectal tube, about half of the fluid expelled came through the perineal wound. The patient thought that gas had escaped through the wound on the day previous.

July 1, 1904.—The recto-urethral perineal fistula persists. All the urine comes through the perineum and gas and feces also escape through it and sometimes through the urethra. Examination with the finger shows an

opening in the anterior wall of the rectum about one inch above the anus, and large enough to admit the end of the finger. Left sided epididymitis developed June 18, but subsided without operation.

Note.—In reviewing the history it is evident that the rectum did not break down until four days after the operation, as previous to that time he had had numerous bowel movements without escape of either gas or feces through the wound. Whether the necrosis was due to the enema or the rectal tube or straining at stool, or to the unprotected condition of the rectum, owing to the levators not being drawn together over it, it is impossible to say, but a tear was probably not made at the operation.

Operation, July 2, 1904.—Ether. Separate closure of rectal and urethral openings. Incisions were made in the previous wound and the fistulæ excised. The rectum communicated with the wound by two fistulous openings, first close to the anus where the opening would admit a finger tip, and second 5 cm. up where it also communicated with the posterior urethra. These openings were joined and after excision of the edges closed with interrupted fine silk sutures, reinforcing sutures to cover in the first row were carefully placed, bringing together considerable amount of muscle in the line of suture. A urethrotomy wound was made in the bulbous urethra and a catheter inserted through it into the bladder. It was found impracticable to close the urethral fistula. After packing the wound lightly the skin was approximated on each side with catgut.

Convalescence.—July 9. Since operation the patient has had a great deal of pain, requiring removal of retention catheter last night. The gauze was removed on the third day. Last night feces came through the perineal wound as freely as before operation.

July 13, 1904.—The catheter has been replaced with the hope of getting the rectal fistula to close.

July 28, 1904.—Although causing considerable pain the catheter was retained until last night. The rectal opening is smaller, but liquid stools still escape through it.

August 15, 1904.—The patient is discharged. He now voids urine at intervals of four hours without pain and in a large stream. Often all of the urine comes through the meatus, at times there is an escape of urine into the rectum, and only a few drops come through the perineal fistula. Fecal matter does not come through the urethra or through the perineal fistula, but gas occasionally passes through both.

Examination.—A silver catheter passes into the bladder with ease. There is no residual urine present. The vesical tonicity is good, but the bladder is somewhat contracted. Rectal examination shows a small opening in the anterior wall. The patient is instructed to use the catheter with the hope that the fistula will heal.

December 7, 1904.—The patient's health has improved greatly. He retains his urine for five or six hours, and voids almost entirely through the penis. The recto-urethral fistula has not closed and when his bowels are loose a small amount of feces still escapes. He has had frequent recurrences of painful epididymitis on both sides.

Third operation, February 6, 1905.—By Drs. Pitts and Smith, of Providence, R. I. Perineal incision, exposure of rectal fistula, suture of edges; drainage of bladder by means of a catheter. Urethral fistula not closed. The catheter remained in place for several days. The patient was up on the 16th day, and left the hospital on the 19th. Examination at end of fourth week showed complete closure of the rectal wound, slight leakage of the perineal fistula. Bladder holds 12 ounces and the patient does not urinate for five or six hours.

November 12, 1905.—The patient voids urine without hesitation or difficulty, has frequent erections and feels perfectly well. Examination shows that the rectal wound is healed and the perineal fistula closed. Epididymes indurated but painless. The urine is almost clear. Micturition normal. No residual urine.

May 8, 1906.—Letter. I void urine naturally, at intervals of about four hours, often 16 ounces at a time. I suffer pain in the scrotum. Do not have erections or intercourse. There is still a very small fistula in the perineum through which a few drops of urine escape. I am entirely cured of the obstruction to urination.

May 19, 1906.—The patient returns for examination. In addition to above note he says that if he retains urine longer than four hours there is occasionally a slight escape of a very small amount of urine, perhaps a teaspoonful, but this is easily avoided by voiding urine at intervals of less than four hours. There is no nocturnal incontinence.

Examination.—The perineal prostatectomy wound and the rectal wound are both firmly closed, and there is no evidence of prostatic enlargement present. A pin-point fistula at the site of the bulbous urethrotomy wound persists. A silver catheter passes with ease. There is no residual urine present, and the bladder capacity is 400 cc. There is no stricture present Urine is acid and contains only a few pus cells. The fistula in the bulbous urethra was almost completely excised, and no sutures introduced.

Pathological report.—The specimen, G. U. 84, consists of the three lobes of the prostate each in one piece and weighs in all 7 gm. The right lobe is the largest; it is fairly smooth, and firm in consistence. On section it is pale with small white dots in a grayish stroma, and is fibrous in feel. It measures 2 x 1.7 x 1.3 cm. The left lateral lobe is somewhat smaller and is similar in character to the right. The median lobe has been torn into three pieces, to one of which a small bit of mucous membrane has been attached. One small lobule about 7 mm. in diameter represents most of the lobe. No ejaculatory ducts, no calculi removed.

Microscopic examination.—The prostate is very interesting microscopically in that there is a very insignificant amount of gland tissue present. The acini present are grouped in a few small areas. The stroma contains considerably more muscle than connective tissue, the muscle fibers being often grouped together in bundles surrounded by a small band of connective tissue with small strands interlacing between the muscle fibers. The blood vessels do not seem to show any particular amount of arteriosclerotic changes. On gross

appearance this prostate presented none of the typical appearance of benign hypertrophy, and microscopically there is no accumulation of gland tissue in lobules. Here and there one finds an area where there are rather numerous acini present which are somewhat dilated and present the intraacinous proliferation which one sees in ordinary hypertrophy cases. The median portion consists largely of fibrous tissue apparently of inflammatory origin. Numerous areas of prostatitis are also noted in the lateral lobes.

Case 40.—*Moderate enlargement of median and lateral lobes. Frequency and difficulty of urination. Occasional hematuria. Cured.*

No. 612. R. W., age 68, single, admitted April 28, 1904.

Complaint.—"Frequency of urination."

No history of gonorrhœa.

Present illness began about four years ago with difficulty of urination. Since then there has been a slight increase in this trouble and a little burning at the neck of the bladder. Two weeks ago hematuria occurred, and the patient consulted a physician who advised prostatectomy.

S. P.—Urination five or six times during the day and four times at night. No pain, but a slight burning during urination. Micturition slow, at times very difficult.

Sexual powers.—Erections are still present, has not had intercourse for years.

Examination.—Patient is well nourished and his lips are of good color. The lungs are negative. There is a moderately intense systolic murmur at the apex and the area of cardiac dullness is increased. Sounds at the base are clear. The abdomen and genitalia are negative.

Rectal.—The prostate is moderately hypertrophied, being about the size of a small orange. It is smooth, soft, elastic, there are no nodules, the median furrow and notch are obliterated. The seminal vesicles are negative.

Urinalysis.—Cloudy, acid, sp. gr. 1017, no sugar, a trace of albumin, urea 19 grams per liter. Microscopically, pus cells and bacilli.

Cystoscopic examination.—A catheter passes with ease and finds 75 cc. residual urine. The bladder capacity is diminished. The tonicity is excellent. The cystoscope shows a fairly large left lateral lobe, a lesser right lateral lobe with a deep sulcus between them, a moderate sized median lobe with a deep sulcus between it and the left lateral lobe and a shallow sulcus between it and the right lateral lobe. The bladder is trabeculated. There is a cystitis of moderate degree, no calculus. With finger in rectum and cystoscope in urethra, the beak can be easily felt, the median portion of the prostate being moderately increased.

June 2, 1904.—Patient returns for operation. He has taken urotropin once daily and water in abundance. He has had no pain. Now voids urine about every two hours during the day and every three hours at night. His general health is excellent.

June 3, 1904.—Operation. Ether. Perineal prostatectomy by the usual technique. The lateral lobes were easily enucleated, but in removing the left lateral, which was the larger, a tear was made in the vesical mucous membrane covering its deeper portion. The median bar was removed, a part with each lateral lobe. The tractor being withdrawn, a finger introduced through the urethra into the bladder showed a small median ridge which was very firmly adherent and less than 1 cm. high. It seemed unnecessary to remove this and nothing else was removed. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. The patient stood the operation well, his pulse being 90 at the end. On return to ward an infusion and continuous irrigation were started.

Convalescence.—The patient reacted well. Temperature 101° on the night after the operation, normal again after five days. The gauze was removed on the second day, and the drainage tubes on the fourth day. He began to walk on the sixth day, urine passed through the anterior urethra on the eighth day, and the fistula closed completely on the twelfth day. Control was established soon after removal of the tubes, and on the eighth day the patient was able to hold urine for several hours. He was discharged on the 19th day, the wound closed, able to hold urine all night, no dribbling, general condition excellent.

October 1, 1904.—The patient has been treated by irrigations with the hope of curing the bacilluria, but without success. He can hold urine for six hours with comfort. The catheter meets no obstruction and finds no residual urine. The bladder capacity is 500 cc. The cystoscope shows a small bar in the median portion (which was intentionally not removed at operation), but this seems to cause no obstruction.

February 1, 1905.—Letter. I am entirely cured. I void urine from three to five times during the day and once or twice at night, large amounts at a time. I have no pain. Erections have not returned.

July 26, 1905.—Urine is retained from four to six hours during the day. Stream large and free, control perfect. Had one erection two months ago. Urine still contains bacilli.

Pathological report.—The specimen, G. U. 85, consists of the two lateral lobes of the prostate, each removed in one piece and weighs in all 43 gm. The left lateral lobe weighs 25 gm., measures 4 x 3 x 3 cm.; presents a fairly smooth external surface with well pronounced capsule, and on section numerous spheroids with considerable stroma and few dilated ducts. The right lobe measures 3.5 x 3 x 2.3 cm. and weighs 18 gm. It is similar in character to the left. No mucous membrane, no ejaculatory ducts, no calculi.

Microscopic examination.—The hypertrophy in both lateral lobes presents the usual picture of glandular hypertrophy. The acini are quite dilated with complex lumina due to small inshoots in the periphery. These inshoots at first contained a thin septum of connective tissue forming a framework for the epithelium of which they are lined, and later on,

as the septum increases in thickness, smooth muscle fibers are seen to be present. In areas there is rather marked cystic dilatation with flattening of the lining epithelium. The stroma seems to contain more glandular elements than muscular fibers. The adenomatous tissue sems to be arranged largely in lobules. Few small areas of interstitial inflammatory infiltration are seen.

CASE 41.—*Moderate hypertrophy of median and lateral lobes. Catheterism. Cured. Followed 22 months.*

No. 694. F. J. D., age 75, married, admitted June 28, 1904.

Complaint.—"Enlarged prostate. Suprapubic fistula."

The patient had never had gonorrhœa.

Present illness began 14 years ago when he began to have slight difficulty in micturition which gradually increased. About four years ago he consulted a doctor who told him that he had an enlarged prostate and attempted to pass a catheter but without success. Three months ago micturition was very frequent and difficult, and he was catheterized for the first time, and a large amount of urine withdrawn. After that he was catheterized once a day by his physician. One month ago he had an attack of severe pain in the region of the right kidney which lasted several hours and returned a week later. During the past two weeks he has suffered considerably with pain in the bladder and has been catheterized twice a day.

Status præsens.—The patient is now catheterized three times daily, about 500 cc. being withdrawn each time. About five hours later he begins to void and suffers considerable pain until he is relieved by catheter. He says that he occasionally has erections, but that he has not had sexual desire or intercourse for several years.

Examination.—The patient is a well nourished man. Lips of good color, heart and lungs negative. No tenderness in the region of the kidneys.

On rectal examination the prostate is found to be moderately and symmetrically enlarged, round, smooth and fairly soft; seminal vesicles not indurated. The urine is slightly cloudy, sp. gr. 1010, acid, no sugar, albumin a slight trace. Microscopically, pus and bacteria. Urea 27 grams daily.

Preliminary treatment.—Catheterization three times a day, urotropin and water in large amounts by mouth. Total daily amount of urine 2500 cc.

Operation, July 2, 1904.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were of moderate size and the median lobe quite small. In removing the latter a small tear was made in the urethra. The wound was closed as usual with gauze packing in the lateral cavities and double drainage tube in the bladder. The patient was infused on the table, and his condition was good at the end of the operation. Pulse at end 80.

Convalescence.—The patient reacted well and continuous irrigation was kept up for 24 hours when the gauze was removed. The catheters were removed on the next day. Urine began to flow through the penis on the sixth day, and the perineal fistula closed on the tenth day. The patient was out of bed on the fourth day and began to walk during the second week. Highest temperature 100.6° on the second day after the operation, after that normal.

July 26, 1904.—The patient can hold his urine for five hours. Catheter passes easily, shows no evidence of stricture and finds 40 cc. residual urine. Bladder capacity is 300 cc. Urine is voided in a large stream, is clear, acid, contains a few leucocytes and no bacteria. The patient discharged, 24th day.

October 23, 1904.—Letter. I am a well man. I urinate once during the night and every six hours during the day. I have no incontinence, but if I do not promptly answer the call there may be a slight escape of urine, but this is improving. I have regained my normal weight.

February 1, 1905.—Letter. I void urine three times during the day and once at night, about 250 cc. at a time, with a large stream and without pain. I have occasional erections.

November 30, 1905.—Letter. The wound has remained closed. I void urine naturally three times during the day and once at night, about one-half pint at a time. I suffer no pain, erections have returned and my general health is excellent, and I think I am cured.

May 8, 1906.—Letter. I void urine naturally four times during the day and once at night. I have no pain. Erections have returned. I have had no complications, my general health is very good. I have gained in weight and consider myself cured.

Case 42.—*Moderate enlargement of median and lateral lobes. Catheter life. Perineal prostatectomy: Incomplete operation; return of obstruction. Second perineal prostatectomy, tear into rectum, suture. Result: Recto-urethral fistula. Complete relief of urinary obstruction. Little discomfort.*

No. 669. J. J. P., age 63, married, admitted July 14, 1904.

Complaint.—" Enlarged prostate. Catheterism."

No history of gonorrhœa.

Present illness began about seven years ago with difficulty and frequency of urination and pain along the urethra. A year later he was catheterized and a large amount of residual urine discovered. Three years ago complete retention of urine came on, and since then he has catheterized himself three times a day.

S. P.—The patient is unable to void and catheterizes himself four times a day. Of late he has suffered considerably from pain in the prostate and bladder. He has not lost weight, his general health is good. His sexual powers are normal.

Examination.—The patient is a healthy looking man with lips of good color. There is no arteriosclerosis. Heart, lungs and abdomen are negative.

Rectal examination.—The prostate is slightly enlarged in both lateral lobes. The contour is irregular, but the consistence is soft. The seminal vesicles could not be reached.

Urinalysis.—Cloudy, slightly acid, sp. gr. 1016, no sugar, no albumin. Microscopically, a few pus cells and bacilli.

Cystoscopic examination.—A large coudè catheter passes with ease and finds 300 cc. urine present (retention of urine is complete). The bladder is large and the tonicity is good. The cystoscope shows only slight intravesical hypertrophy of the two lateral lobes, and a small rounded median lobe with a deep sulcus on both sides. The bladder is markedly trabeculated and inflamed, numerous septa and deep pouches being present. There are no calculi and no diverticula. With finger in rectum and cystoscope in urethra the median portion of the prostate is moderately increased.

Operation, July 15, 1904.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were only slightly enlarged and were very adherent and each was removed in two pieces. It was impossibe to engage the median lobe with the tractor which was then withdrawn and the finger inserted. A small sessile median lobe, the size of a pea, was discovered and carried into the left lateral cavity by means of the index finger of the left hand where it was enucleated by means of a sharp periostal elevator, a small tear being made in the mucous membrane covering it. After removal it measured 1 cm. in diameter. The ejaculatory ducts and urethra were preserved intact. The wound was closed as usual with double drainage tubes and light packs for the lateral cavities. The patient's condition at the end of the operation was good. Submammary infusion was given on return to ward and continuous vesical irrigation was instituted.

Convalescence.—The patient reacted well, but had a slight temperature for five days after the operation, reaching 101.7° on the second day. The gauze was removed at the end of 30 hours, and the tubes on the next day. The urine began to pass through the urethra on the 12th day. Epididymitis developed on the left side on the 18th day, and was accompanied by fever which reached 104° and persisted for a week. On August 5 phlebitis of the right saphenous vein developed. The patient left the hospital August 14. The perineal fistula was not healed, and urine very purulent.

October 8, 1904.—The patient has had a very unsatisfactory convalescence. Both testicles have suppurated and had to be opened. He has had considerable trouble from phlebitis and the fistula has never healed. He voids urine in a fairly large stream, but has to arise three times during the night, and a catheter finds 500 cc. residual urine. Examination of the prostate by rectum shows a fairly considerable cicatrix, but no evidence of remaining prostatic lobes. The cystoscope shows a very small but rounded median bar, the lateral lobes are not at all enlarged.

July 15, 1905.—From January until May the patient felt well, used a catheter at bed time and did not have to void during the night. Residual

urine varied from 50 to 500 cc. During the day he voided at intervals of two hours. About one month ago catheterization bebcame very difficult and painful. For the past two weeks he has had to use the catheter three times a day to prevent incontinence. Cystoscopic examination again showed a small rounded median mass which evidently acted as an obstruction. With finger in rectum and cystoscope in urethra, a hard ring surrounding the cystoscope was found in the region of the prostate.

The following remark was made: It was evident that the first operation did not completely remove the enlargement of the median portion of the prostate and that there is definite obstruction in this region of a suburethral rather than an intravesical character. A second perineal operation is advised with the object of removing this portion of the prostate.

July 17, 1905.—Operation. Ether. Inverted V-incision through the scar of previous operation. The prostate was very difficult to expose, owing to the considerable amount of cicatricial tissue and its intimate adhesions to the rectum. In this dissection a small tear was made by the finger in the rectum. This was closed apparently satisfactorily with three layers of silk sutures. The urethra was opened through the left lateral wall and the median portion of the prostate with some mucous membrane was removed. This measured only 1 x 1 x 2 cm. in size, but very fibrous and had to be excised with knife and scissors. A mass of tissue measuring 2 x 1½ x 1½ cm. in size was removed from the left lateral lobe. The region of the right lateral lobe was not removed. The rectum was covered over with the levator and muscles which were drawn together with catgut sutures. The wound was closed as usual with double tube drainage and light iodoform gauze packing.

Convalescence.—The patient reacted well, but had a slight fever for four days. The gauze was removed on the ninth day and the tubes on the tenth day.

July 30.—The patient is up in a wheel-chair. Urine has passed partly through the penis since the seventh day. No evidence of rectal suture breaking down.

August 1.—Bowels moved for the first time to-day. No evidence of rectal suture giving way.

August 5.—Bowels moving without pain. Urine passes through the wound.

August 8.—Fecal matter passed through the penis with urine to-day. Recto-urethral fistula present.

August 16.—No more fecal matter through the penis, but flatus escapes through it. Rectal examination discloses a small opening in the bowel, surrounded by considerable tissue. The perineal wound is healed except for a pin-point sinus. The patient voids urine at intervals of three to five hours and most of the urine comes through the penis.

August 20.—Rectal and perineal fistulæ persist. The patient has an occasional severe pain in the urethra. He is discharged to-day.

October 17, 1905.—Letter. I pass urine three times during the night and in the morning have a discharge of feces and urine from the rectum, and urine coming from the penis twice before breakfast and generally two or three times after breakfast. After the middle of the day the discharges are less frequent and more controllable. The passage of fecal matter through the penis is growing less. I have pain before, during and after the discharges, and constant soreness in perineum and testicles.

December 17, 1905.—Letter. The perineal fistula is closed (Nov. 1). I void urine naturally about ten times during the day and four or five times during the night, four ounces at a time. I suffer pain before, during and after urination. I do not have erections. My general health is fair.

February 6, 1906.—Letter. The perineal wound is closed, but there is still a communication through the perineum and urethra through which gas occasionally escapes into the urethra. About one-quarter of the urine passes through the rectum, the rest is voided through the meatus. I urinate seven times during the day and four times at night, from two to four ounces at a time. I suffer much pain before, during and after urination, but am comfortable when sitting still.

April 21, 1906.—The recto-urethral fistula is still open, but no feces ever pass through the penis, and when the bowels are very loose there is only a very slight coloring of the urine. Frequently no urine passes into the rectum, but if he strains very hard (which he is in the habit of doing if the urine does not flow at once) a small portion of urine passes into the bowel, but this occurs very rarely. He voids urine in a good stream, without difficulty, and at intervals of about six hours during the day. He often does not get up at all during the night to urinate. He has practically no pain, only a slight one when the bladder is very full. He looks well and has gained in weight.

Examination.—Patient voided 150 cc. of slightly cloudy, acid urine. With the finger in the rectum a small fistulous opening is felt 4 cm. above the anus. There is no urine in the rectum, although the patient has just voided.

Remark.—The patient says he feels so comfortable, has so little trouble on account of the fistula that he does not wish to have an operation to close it. The prostatic obstruction seems to be completely relieved as a result of the second operation.

Case 43.—*Considerable enlargement of the lateral lobes. Catheterized twice daily. Cured. No complications. Followed 21 months.*

No. 689. J. S. T., age 72, widower, admitted August 5, 1904.

Complaint.—" Incomplete retention of urine. Catheterism."

No history of gonorrhœa.

Present illness began six years ago with intermittent attacks of frequency of urination. About four years ago he began to have hemorrhages from the urethra while asleep and occasionally during urination. These continued at intervals of three or four months. In December, 1903, he

began to suffer for the first time with difficulty and pain during urination. A catheter drew off one quart of residual urine. Since then the patient has been catheterized twice daily, but retention of urine has never been complete.

S. P.—The patient is in good health, suffers no pain, is catheterized night and morning. After about eight hours he begins to void frequently and with difficulty. The residual urine is usually a pint. No note as to sexual powers.

Examination.—The patient is a sturdy-looking man, lips of good color. The pulse is regular, 72 to the minute, and the arteries are not sclerotic. The chest and abdomen are negative.

Rectal.—The prostate is considerably enlarged, the left lobe being the larger, and its upper end difficult to reach. The prostate is rounded, smooth, elastic, there are no nodules or areas of induration. The seminal vesicles are not palpable.

Cystoscopic examination.—A large coudè catheter passes with ease and finds 650 cc. residual urine. Cystoscopy was unsatisfactory owing to hemorrhage.

Urinalysis.—Cloudy, acid, sp. gr. 1022, no sugar, trace of albumin, urea 10 grams to the liter. Microscopically, pus cells and a few hyaline casts.

Operation, August 9, 1904.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes of the prostate were easily enucleated and were removed each in one piece. The left lateral lobe was the larger, measuring 8 x 5 x 6 cm. in size. The right lobe measured about 6 cm. in diameter. No tear was made in the urethra or bladder. An attempt was made to examine the vesical orifice with a finger through the urethra, but owing to the great length of the urethra this was impossible. By palpating the neck of the bladder against the prostatic tractor, the operator concluded that there was little if any median enlargement and nothing further was removed. The wound was closed as usual with double catheter drainage. Light packs for the lateral cavities. The patient stood the operation well. He was infused on the table and continuous irrigation begun on return to ward. His pulse at the end of the operation was 95.

Convalescence.—The temperature on the day following the operation reached 102°, but returned to normal on the third day. After that there was an evening temperature of 100° almost every day until August 20. The gauze and catheters were removed on the third day. On the 11th day half of the urine came through the urethra, and the patient was able to hold his urine for four hours and was up and about. The perineal fistula closed on the 16th day and the patient was discharged on the 17th day. At that time he had perfect control and retained his urine for six hours or more and the wound was closed. His condition was excellent.

February 1, 1905.—I have not used a catheter since operation. I void urine four times during the day and twice at night, about 400 cc. at a

time. I have no pain and consider myself cured. I have no erections. My general health is excellent.

November 30, 1905.—Letter. The wound remains healed. I void urine naturally, once at night, four to five times during the day, about 400 cc. at a time. I have a slight burning in the urethra after urination. I have no erections. My general health is excellent, and I consider myself cured.

May 7, 1906.—Letter. I void urine naturally about four times a day and once at night, from 300 to 400 cc. at a time. I have no pain, no erections. My general health is good and I consider myself cured.

Pathological report.—The specimen, G. U. 91, consists of the two lateral lobes of the prostate, each of which has been removed in one small piece, and weighs in all 78 gm. The left lobe is a large oval mass 8 x 5 x 4 cm. in size and weighs 55 gm. It is composed of lobules more or less encapsulated and firmly bound together. It is elastic on section; and there are numerous large and small spheroids with little intervening stroma, and few dilated acini. The right lobe measures 5 x 4 x 2.5 cm. and weighs 23 gm. It is more lobulated than the left, and on section shows more dilated acini, but there is very little stroma. No mucous membrane, no ejaculatory ducts, no calculus.

Microscopic examination.—The hypertrophy is a markedly glandular one, and shows the usual arrangement in lobules. The acini are in some areas small, in others moderately dilated, and some show considerable cystic degeneration with flattening of the lining epithelial cells. There is rather an extensive prostatitis present. The stroma contains much more connective tissue than muscle. There are areas where the epithelium lining the endoglandular sprouts shows a rather wild profusion. No evidence of carcinoma.

CASE 44.—*Slight enlargement of lateral and median lobes. Residual urine 1000 cc. Operation incomplete. Median bar left. Improved. Unsatisfactory result. Followed 21 months.*

No. 1330. F. D., age 65, married, admitted August 5, 1904.

Complaint.—"Inability to hold urine."

No history of gonorrhœa.

Present illness began three years ago with increased frequency of urination. Of late this has increased considerably and urination has been very precipitate.

S. P.—Urination every 15 minutes during the day and six to eight times during the night. No pain, no straining on urination, but considerable precipitancy. Has never had complete retention, nor has been catheterized.

Sexual powers.—Normal up to three months ago, since then no erections. General health good.

Examination.—The patient is a rather weak-looking man with lips slightly pale. The chest wall is rigid, percussion hyperresonant throughout.

Heart.—The point of maximum impulse is in the fifth interspace about 1 cm. outside of the nipple line. The sounds are clear at apex and base, but the second aortic is markedly accentuated and the first aortic is rumbling in character. Abdomen and genitalia negative.

Rectal.—The prostate is very slightly enlarged, but it bulges considerably more towards the rectum than the normal prostate, and the median groove and notch are replaced by a rounded mass. It is smooth, rounded, elastic, and uniform. The seminal vesicles are soft, and there are no glands to be felt.

Cystoscopic.—A large coudè catheter is obstructed in the middle of the prostatic urethra and will not enter the bladder. A silver catheter is passed with ease, and 1000 cc. residual urine withdrawn. The cystoscope shows a very slight hypertrophy of the median and lateral lobes in the shape of a collar with a small cleft anteriorly. The median portion is only slightly increased in the shape of a bar. The ureters and most of the trigone are seen. With finger in rectum and cystoscope in urethra there is only slight increase in the median portion of the prostate.

Urinalysis.—The urine is clear and contains no pus or bacteria. Sp. gr. 1009, acid, no sugar, albumin a trace.

Preliminary treatment.—Urotropin, water in abundance, and catheterization two or three times daily. Under this treatment the patient improved considerably, but he voided large quantities of urine. The specific gravity increased from 1009 to 1015, and the urea from 10 gm. to 14 gm. per liter.

Operation, August 18, 1904.—Chloroform. Perineal prostatectomy by the usual technique. The lateral lobes were easily enucleated each in one piece and were only slightly enlarged. A small rounded median lobe, the size of a filbert, was enucleated from beneath the urethra. (At the time it was supposed that this represented all the median enlargement, and nothing further was removed. The finger was not inserted through the urethra into the bladder.) The wound was closed as usual with double tube drainage and light packs for the lateral cavities. The patient stood the operation well, pulse at the end 70. Continuous irrigation on return to the ward.

Convalescence.—The temperature did not rise above 99.4°, and the patient reacted well. Continuous irrigation was stopped at the end of 28 hours. The gauze and tubes were removed on the third day, and the patient was out of bed on the fourth day. On the fifth day a fair amount of urine was voided through the penis, and the patient was discharged on the 25th day. The perineal fistula was still open, and there was a slight incontinence of urine. His general condition was excellent.

March 25, 1905.—The perineal fistula is not yet closed, and the patient voids urine at frequent intervals. A catheter finds sometimes 200 cc. and at others 300 cc. residual urine. The cystoscope shows a slight round median bar, but no sulcus on either side, and a small intraure-

thral lobule on the right side somewhat anterior to the cystoscope. With finger in rectum and cystoscope in urethra the median portion feels no thicker than normal. The patient was advised to catheterize himself once daily.

September 6, 1905.—The patient catheterizes himself twice a day and finds about 300 cc. residual urine. A small perineal fistula is still present through which only a few drops of urine escape. The cystoscope shows a small rounded median lobe which has grown definitely since the last examination, six months ago. There is also a slight hypertrophy of both lateral lobes which present mostly intraurethrally, but do not come together in front. The bladder is moderately inflamed. There is no stone present.

Note.—It seems evident that the median portion of the prostate was not completely removed at operation and the result has never been satisfactory. The median lobe now is distinctly larger than before operation. Another operation was advised, but the patient would not submit to it.

May 19, 1906.—Patient returns for examination. He says he uses the catheter at night and withdraws about half a pint of urine. He then does not urinate until morning. He generally uses a catheter also on arising in the morning and about four hours later begins to void urine naturally, and after that urinates at intervals of two hours until catheterization at bed time. He would be able to get along without catheterization, but feels more comfortable under this treatment. A few drops of urine escape through the fistula at each urination. There is no incontinence, his general health is good. He does not have erections.

Examination.—The patient looks well. He voided 100 cc. of urine and a catheter withdrew 400 cc. The cystoscope shows a small but definite rounded median lobe with a very shallow sulcus on the left side. The lateral lobes are not at all intravesically enlarged. There is no stone present, the bladder is only slightly trabeculated and moderately inflamed.

Remark.—It is evident that in this case all of the median prostatic obstruction was not removed, and the imperfect result is directly due to this cause.

Pathological report.—The specimen, G. U. 92, consists of the two lateral lobes of the prostate and weighs 15 gm. The left lobe has been removed in one piece, weighs 9 gm., is coarsely lobulated, and considerably torn. One large spheroid about 2 cm. in diameter is present. On section there is considerable stroma, and slight amount of gland dilatation. The right lobe weighs 6 gm., is also irregular, and has been removed in two pieces. On section it is very firm, there is considerable stroma, no gland dilatation. No mucous membrane has been removed, no calculi. No ejaculatory ducts seen.

Microscopic examination.—The hypertrophy in both lobes is of the same character, and the gland tissue and stroma are present in about equal amounts. There is some lobulation present, but even within the lobules

the stroma is almost as plentiful as the gland tissue. The acini within the lobules are separated from each other as a rule by fair sized bands of interstitial tissue. The acini are only slightly dilated, and in many places quite small. The acini in the stroma about the periphery are compressed. The acini as a whole do not show the same tendency to proliferation and complexity of lumina which one sees in more glandular hypertrophy. The stroma contains a large amount of muscle, the relative amounts of muscle and connective tissue varying in different areas. The hypertrophy is one in which there has been an increase in the fibrous and muscular elements in fairly equal proportions.

CASE 45.—*Moderate hypertrophy of median and lateral lobes. Four vesical calculi. Improvement. Pain still present (calculus returned?). Catheter not required.*

No. 703. P. A. H., age 58, married, admitted August 8, 1904

Complaint.—"Bladder trouble."

No history of gonorrhœa.

Present illness began six years ago with increased frequency of urination and burning in the urethra. During the next four years there was a gradual increase in both of these symptoms, the pain being severe. Complete retention of urine came on for the first time two years ago and he was catheterized. After that retention and catheterization at gradually shortening intervals. For three weeks past retention has been complete and the catheter necessary every four to six hours. Has had considerable pain across the back and in the bladder, but none elsewhere.

S. P.—The patient is now able to pass small amounts of urine, but uses the catheter twice daily. He has not lost weight.

Sexual powers.—Erections and intercourse were normal up to three months ago. During the past year there has been a slight pain on ejaculation and an apparent stoppage—very little semen.

Examination.—Patient is well nourished with lips of good color. Chest and abdomen negative.

Rectal.—The prostate is moderately hypertrophied, about the size of a small apple. It is round, smooth, firm but not hard. Median furrow and notch are obliterated. The seminal vesicles are not palpable.

Cystoscopic.—The patient voided 150 cc. and a coudè catheter found 65 cc. residual urine. The bladder capacity is 420 cc. Urethral length 9½ inches. The cystoscope shows a moderate hypertrophy of the lateral lobes with a fairly deep cleft between them in front and an irregular granular small median bar which joins them posteriorly. In the base of the bladder are several stones covered by considerable mucous. The bladder is inflamed. With finger in rectum the cystoscope in urethra there is considerable increase in the thickness of the median portion of the prostate, but very little in the urethral length.

Urinalysis.—Cloudy, 1012, acid, no sugar, albumin a trace. Microscopically, pus and bacteria.

Operation, August 22, 1904.—Ether. Perineal prostatectomy by the usual technique.

Lithotomy.—Left lateral lobe was only slightly hypertrophied and was removed in two pieces, one of which lay anterior to the urethra. The right lateral lobe was moderately enlarged, and a small median bar was removed in one piece with it. Examination with the finger in the urethra then showed no remaining prostatic enlargement. A small gall bladder scoup was then introduced and four small calculi, 6, 8 and 12 mm. in diameter were removed. The urethra was torn, but no mucous membrane was removed. The wound was closed as usual with double drainage tubes in the bladder and light packs for the lateral cavities. Patient stood the operation well. Pulse at the end 95. Infusion and continuous irrigation on return to the ward.

Convalescence.—The patient reacted well. The temperature rose on the day after the operation to 100.4°, but was normal the next day and only once rose to 100° afterwards. Continuous irrigation was kept up for 48 hours when the gauze and catheters were removed. The patient was out of bed on the fourth day, condition excellent. On the eighth day slight epididymitis, which was relieved by ice cap. Urine came through the anterior urethra on the eighth day, and the perineal fistula closed on the 18th day. The patient was discharged on the 21st day in good condition, the wound healed, voiding urine in a good stream. A silver catheter passed easily, and showed 50 cc. residual urine and bladder capacity of 250 cc.

November 30, 1905.—Letter. The wound has remained healed, and I have not used a catheter. During the night I am able to sleep four hours, but in the day I suffer pain and void urine frequently, sometimes every 30 minutes. I have a feeling as if a gravel is trying to pass. I am very nervous and have lost 25 pounds in weight. I have no desire for sexual intercourse.

Note.—It is evident that calculus is present, and probably responsible for the pain and frequency of urination in the day time.

Pathological report.—The specimen, G. U. 93, consists of two lateral lobes removed in three pieces. There is no median lobe present. Total weight of the prostate is 22 gm., the right lobe weighing 14 and the left 8 gm. The right lateral lobe is coarsely lobulated, of uniform consistency, soft and elastic. Its constituent spheroids are firmly bound together by connective tissue. The left lateral lobe has been removed in two pieces which are similar in character to the other lobes. No evidence of ejaculatory ducts or urethral mucous membrane is present. Four small stones have been removed. These have a smooth surface, and are about equal in size, each measuring .5 cm. in diameter.

Microscopic examination.—The hypertrophy is a distinctly glandular one with a lobular arrangement. Within the lobules the acini are rather small, closely set with rather slender bands of interlacing stroma. About the periphery of the lobules the stroma is condensed, and contains numerous elongated flattened culs-de-sac. The stroma contains considerable spindle-cell tissue especially where the glandular proliferation is most marked. There is a comparatively small amount of muscle in the stroma.

CASE 46.—*Moderate hypertrophy. Residuum 80 cc. Bladder contracted, 160 cc. Result: Relieved of difficulty, pain and frequency considerably. Secondary calculus probable.*

No. 705. W. W. H., age 68, married, admitted August 20, 1904.

Complaint.—"Bladder and prostatic trouble."

No history of gonorrhœa.

Present illness began four years ago when the patient had two hemorrhages from his bladder. Previous to that there had been no difficulty or frequency of urination. Since then there has been a gradual increase in the frequency and difficulty of urination, but only once has there been any blood in the urine. Pain has been present for several months and is worse during urination. He has never had complete retention of urine nor has he been catheterized.

S. P.—The patient voids urine about nine times at night and every half hour during the day. Urination is difficult and slow and painful, particularly at the end of the penis. He has no pain in the back, rectum or thighs and his urine is clear. He has lost 30 pounds in the last year. One week ago his testicle became swollen, but subsided rapidly under applications of ice. His bowels are regular and defecation not painful. His chief complaint is pain which is very severe. Erections are weak and intercourse impossible.

Examination.—The patient is well nourished with mucous membranes of good color. His heart and lungs are negative. His pulse 70 to the minute, arteries soft. Abdomen is negative.

Genitalia.—There is no urethral discharge. The right epididymis and vas are indurated. Left epididymis is also indurated. On the right side there is a small complete inguinal hernia.

Rectal examination.—The prostate is considerably enlarged in both lateral lobes, the upper end being difficult to reach, especially on the left side. The median furrow is shallow, but the notch is quite deep. The prostate is soft, elastic, smooth and there are no areas of induration. On the left side the prostate extends well up into the region of the seminal vesicle, but there is no induration and there are no glands to be felt.

Cystoscopic examination.—A coudè catheter passes with ease and finds 80 cc. residual urine. Bladder capacity is 160 cc., the tonicity good. Urethral length is nine and one-half inches. During the introduction of the cystoscope traumatism of the prostatic urethra was produced, making cystoscopy very unsatisfactory. It was impossible to get a good view of the bladder, but no tumor or stone was seen. The base of the bladder and ureters could not be seen. The prostatic orifice was surrounded by considerable hypertrophy in the shape of a collar, but the clefts could not be made out. With finger in rectum and cystoscope in urethra it was impossible to feel the beak of the instrument, owing to the increased length of the prostate.

Urinalysis.—Cloudy, slightly acid, sp. gr. 1012, albumin in small amount. Microscopically, pus and bacilli in great number.

Operation, August 26, 1904.—Ether. Perineal prostatectomy by the usual technique. Unfortunately no careful notes of this operation have been preserved. The lobes were indurated, very adherent and came away in numerous small pieces. The median portion of the prostate was small and was removed through one of the lateral cavities. No stone was found in the bladder. The wound was closed as usual with tube and gauze drainage.

Convalescence.—The patient reacted well, his pulse being 88 at the end of the operation. He was given an infusion on return to the ward. The gauze and tubes were removed together on the third day, and the urine first passed through the penis on the ninth day. There was more hemorrhage and pain than usual and the irrigation was continued for two days. On the second day the patient began to be nauseated and continued so until the sixth day. During this time he had a fever which reached 103° on the third day. The patient was difficult to manage and insisted on leaving on the 15th day. At that time urine was still coming through the perineum, and his condition was not comfortable. (The operator was out of town during most of his stay in the hospital, and did not see him when he left.)

November 30, 1905.—Letter. The perineal wound is closed. I do not use a catheter, but void urine very frequently, sometimes every 10 minutes. Very seldom does one hour intervene between urinations except at night. The largest amount voided is about two and one-half ounces. I suffer pain, before, during and after urination. Erections are present, but weak.

May 8, 1906.—Letter. The perineal wound has remained healed. I am not cured, I void urine too frequently and suffer pain. I am not very much better than I was several months ago. I think my trouble is with the bladder and not with the prostate gland. I have erections seldom and very feeble, too imperfect for sexual intercourse.

Pathological report.—The specimen, G. U. 94, consists of numerous pieces which go to form the right, left and median lobes of the prostate which weigh respectively 12 gm., 14 gm., 4 gm., the total weight being 30 gm. The tissue is composed of many small spheroids more or less firmly attached to each other. The consistence is soft and elastic, and the color yellowish gray. No mucous membrane or ejaculatory ducts have been removed.

Microscopic examination.—The hypertrophy is a moderately glandular one. The acini are dilated, some showing flattening of the epithelium and cystic degeneration. The acini show considerable glandular proliferation. Here and there are areas of fibrous tissue hyperplasia in which the glands are undergoing atrophy, evidently the result of an old prostatitis. The gland tissue is for the most part arranged in lobules, the peripheral stroma containing compressed, and in some instances, atrophied acini. The stroma is rather dense, and contains considerable young connective tissue. The muscle element is comparatively small in amount, and is much more in evidence in the heavy bands of stroma. Some prostatitis is present. The arteries are normal except in some fibrous areas where they are considerably thickened.

Case 47.—*Slight enlargement of prostate. Large oxalate calculus. No pain. Cure. Followed 20 months.*

No. 714. J. A. S., age 65, married, admitted September 2, 1904.

Complaint.—" Frequency of urination."

No history of gonorrhœa.

Present illness began 10 years ago with slight frequency of urination during the day and burning sensation in the urethra during the night. Four years ago he began to get up at night to urinate, and has had very frequent urination during the day, but no pain. One month ago for the first time he began to have a dull soreness in the urethra during and after urination, but no severe pain and no hemorrhage. These symptoms have persisted up to the present time.

S. P.—The patient voids urine every hour during the day, but without difficulty or pain. There is a slight soreness in the urethra just before and after urination which soon disappears. Sexual powers were normal up to a month ago. His general health has remained good.

Examination.—Patient is a strong, well nourished man with lips of good color. Heart and lungs are negative. Arteries are slightly sclerotic. Chest and abdomen negative.

Rectal.—Prostate is moderately enlarged in both lateral lobes, rounded in contour, smooth, firm but elastic with no areas of induration. The seminal vesicles are not indurated.

Urinalysis.—Cloudy, acid, sp. gr. 1020, albumin a trace, no sugar, urea 10 gm. daily. Microscopically, squamous epithelium.

Cystoscopic examination.—A catheter passes with ease and finds only 15 cc. residual urine. The bladder is very irritable and will hold only 50 cc. The cystoscope shows a large rough brown stone lying between the upper limits of the intravesical portions of the prostate and the anterior wall of the bladder. There is no stone in the region of the trigone or base of the bladder. Study of the prostatic orifice shows a moderate hypertrophy of both lateral lobes, and a small median bar. With finger in rectum and cystoscope in urethra there is only a moderate increase in the median portion.

Operation, September 3, 1904.—Ether. Perineal prostatectomy by the usual technique, and lithotomy. The lateral lobes were only slightly hypertrophied and were easily removed. Examination showed that the enlargement of the median portion was too small to warrant removal. The urethra, which, up to this point, was not torn, was now divided with scissors along its left lateral surface, the neck of the bladder dilated and stone forceps inserted. A large stone was at once caught and drawn towards the urethra. It was found to be too large to come through the dilated vesical orifice. By making stout traction upon the forceps the vesical neck was drawn well into the left lateral cavity of the prostate where it was easily divided with a scalpel upon the stone which was at once extracted through the enlarged opening thus obtained. Two sutures were taken in the divided vesical neck and ure-

thra and drainage tubes were placed through the urethra into the bladder and the lateral cavities were lightly packed with gauze and the wound closed as usual. There was very little hemorrhage. The patient stood the operation well. An infusion of salt solution was given on his return to room and continuous irrigation was begun.

Convalescence.—The temperature rose to 100.5° on the night of the operation, but was practically normal after the second day. The catheters and gauze were removed on the day following the operation. Urine came through the penis on the 12th day, and the perineal fistula closed on the 16th day. The patient left the hospital on the 25th day; at that time he was able to retain urine for three hours, had no pain, no incontinence except a tendency to dribble when the bladder became full. A catheter passed without meeting any obstruction, found no residual urine, a bladder capacity of 180 cc. Urine was slightly cloudy, and contained pus cells and bacilli. The patient was discharged with directions to take urotropin and to retain urine as long as possible to distend the bladder.

February 1, 1905.—I void urine naturally once at night, and every three or four hours during the day in large amounts at a time. I suffer no pain and consider myself cured.

March 30, 1905.—Urination is free, he does not arise at night, has perfect control, no dribbling. Erections and sexual desire are returning and intercourse is again possible. The wound is completely healed. A silver catheter passes without meeting an obstruction and finds no residual urine. The bladder capacity is large, the tonicity excellent. Urine contains pus cells and bacilli.

November 30, 1905.—Letter. I do not get up at night to void, and urinate every three or four hours during the day in a large stream and without pain. I have erections and my general health is excellent. Examination of the calculus showed pure uric acid.

May 7, 1906.—Letter. I void urine naturally about every four hours during the day and do not have to get up at night. I suffer no pain. Have erections occasionally. My general health is good, I have gained in weight, and I consider myself cured.

Pathological report.—The specimen, G. U. 95, consists of the two lateral lobes of the prostate, each removed in one piece, and weighs about 19 gm. The right lobe is the larger, weighs 12 gm. and measures 3.5 x 2.5 x 2 cm. The surface is fairly smooth with a few lobules. Section shows considerable fibrous stroma with small spheroids and a fair number of dilated acini. The left lobe weighs 9 gm., measures 3 x 2 x 1.5 cm., is oval in shape, and shows considerable stroma, dilated ducts, and one large spheroid. The consistence is everywhere elastic. No mucous membrane, no ejaculatory ducts, no calculus in prostate. A large oxalate calculus about 5 cm. in diameter as shown in photograph (see Fig. 35) has been removed.

Microscopic examination.—The hypertrophy is a lobulated distinctly glandular type. The acini are dilated, and possess irregular lumina. The

stroma in the lobules is very insignificant in amount, there being often but very slender bands of interstitial tissue between the acini. The stroma is very rich in muscle, which would seem to be somewhat in excess of the connective tissue. Some few areas of round celled infiltration are present in the stroma. Numerous corpora amylacea are present in the ducts. An occasional acinus is seen containing some leucocytes and granular debris with no change in the epithelium of the acinous nor any periacinous infiltration.

CASE 48.—*Moderate hypertrophy of lateral lobes. Very little median enlargement. Several calculi in bladder. Cured. Followed 20 months.*

No. 777. J. P. W., age 75, admitted September 19, 1904.

Complaint.—"Bladder trouble."

No history of gonorrhœa.

Present illness began about 10 years ago with difficulty and frequency of urination, which has gradually increased. Four years ago had an attack of pain in the left back and radiating thence to the left groin, and lasting about three hours. Since then urination has been painful. Hematuria has occurred frequently.

S. P.—The patient now urinates about every 15 minutes night and day. Micturition very painful and sometimes accompanied with blood. He uses a catheter about once a day, but withdraws only a small amount of urine and has to urinate again in an hour.

Sexual power.—Sexual desire is gone and erections are very slight. Has not had intercourse for four years.

Examination.—The patient is a weak, sick-looking man, very emaciated and pale. The lungs are emphysematous, and there is a slight systolic murmur at the base of the heart. The area of cardiac dullness is considerably increased. Palpation of the hypogastric area is painful. Genitalia negative.

Rectal.—The prostate is considerably enlarged, smooth, evidently not malignant.

Cystoscopic examination.—Catheterization produces hemorrhage and the bladder is very irritable and small. Cystoscope shows a vesical calculus, but the examination is unsatisfactory.

Urinalysis.—Acid 1020, no sugar, no albumin, urea 5 gm. to liter, pus and epithelium.

Operation, September 21, 1904.—Ether. Perineal prostatectomy by the usual technique, removal of vesical calculi. The lateral lobes were very small, adherent, and when removed measured only about 2 cm. in diameter. No median enlargement was removed. The urethra was divided along the left lateral wall and several calculi easily extracted. The largest measures 3 x 2 x 1 cm. in size. The ejaculatory ducts were preserved. The wound was closed as usual with double drainage tubes and gauze for the lateral cavities. The patient stood the operation very well. The pulse at the beginning was 104°, was 100° at the end, and on return to the ward was 72°. Three hours after the operation

the pulse was 70, but the respirations became extremely shallow and rapid and after a few minutes imperceptible. He was given strychnine grains 1-20 and an infusion of salt solution (which for some reason had been omitted) was started. He also received morphia grains ¼ hypodermically. After half an hour his breathing became more natural, and two hours afterwards was 24 to the minute and pulse 90.

Convalescence.—The patient suffered considerable pain for 24 hours after the operation and received half a grain of morphia. After that he convalesced well, but had a temperature which reached 101° almost every day for two weeks, after which it was normal. The irrigation was stopped at the end of 12 hours, and the gauze and tubes were removed on the third day. He was up in a chair on the seventh day, and the urine was coming partly through the anterior urethra. Urination continued painful for three weeks. The patient was discharged on the 34th day in good condition, voiding urine through the urethra, but at frequent intervals. The fistula closed completely on the 27th day.

November 8, 1904.—The patient says that he is more comfortable and in better health than he has been for years. During the day he urinates every three hours and at night every hour. He has a slight burning on urination, but no pain and no dribbling. The perineal wound is entirely healed and has been since the 27th day. A catheter passes with ease, shows no evidence or obstruction, finds 40 cc. residual urine, a contracted bladder which can be dilated forcibly up to 210 cc. Is to return for dilatation of bladder by hydraulic pressure every day.

November 11, 1904.—Bladder dilated up to 250 cc.

November 25, 1904.—The bladder has received no treatment since last note. Urination every two or three hours, bladder capacity 300 cc. on forced distention.

November 30, 1905.—Letter. Urination three times during the day and three at night, about one-half pint at a time; no pain, no fistula. I consider myself cured, have no erections. My general health is excellent.

February 14, 1906.—Letter. I am in perfect health, and can hold my urine easily from three to five hours.

May 8, 1906.—The patient returns for examination. He says he voids urine at intervals of four or five hours during the day, and once or twice at night, from eight ounces to a pint at a time. He suffers no pain, except slight discomfort when the bladder becomes too full. He has erections occasionally, but not sufficient for intercourse. His general health is good, has gained 25 pounds in weight, and he considers himself cured. A catheter passes with ease and finds 5 cc. residual urine, bladder capacity 350 cc. Rectal examination negative.

Pathological report.—The specimen, G. U. 96, consists of the two lateral lobes of the prostate removed in eight small pieces and weighing in all 18 gm. The right lobe consists of two pieces, 1.5 x 1.5 x .5 cm. and 2 x .5 x .5 in size respectively. The tissue is firm, homogeneous and

shows definite arrangement in lobules. Considerable fibrous tissue is present in the smaller piece. The left lobe consists of six small pieces of tissue mostly in the shape of spherical masses. On section they show gland tissue with intervening stroma. Two stones have been removed, the larger weighing 13 gm., and the smaller 6 gm.

Microscopic examination.—The hypertrophy is rather of the fibromuscular type with here and there areas fairly rich in acini. In these more glandular areas the acini are for the most part dilated with occasional cystic degeneration, while the lumina have considerable complexity of outline. The stroma contains a fair amount of muscle, and there is present considerable embryonic connective tissue formation with some round cell infiltration. In the areas where the stroma predominates the acini are rather small, apparently regular in outline, although sometimes elongated apparently from compression. The epithelium lining the ducts is normal. Within the stroma there is much spindle celled tissue formation and some round cell infiltration. Around some of the acini there has been considerable new connective tissue formation with some infiltration of round and polynuclear cells, and degenerated epithelial cells and granular debris are seen within the ducts. One sees an occasional nodule in which only vestiges of acini persist, and composed almost entirely of fibrous tissue, an insignificant amount of muscle fibers being present. These nodules are encapsulated, the capsule being formed of condensed stroma and containing compressed, elongated acini.

Case 49.—*Moderate enlargement of lateral lobes of prostate. Catheter one year. Nephritis. Uremia. Cured.*

No. 1329. A. D. C., age 82, widower, admitted September 1, 1904.

Complaint.—"Retention of urine."

No history of gonorrhœa.

Present illness began about three years ago with difficulty in urination. About a year ago he had retention of urine for the first time, and since then has catheterized himself on this account three or four times. He has had no pain except when the bladder has been distended, no hematuria except after catheterization. During the past year he has had to get up two to three times at night to urinate.

S. P.—The patient now has complete retention of urine and has been unable to use his catheter.

Sexual powers.—No note made.

Examination.—The patient is a very weak looking man, emaciated, lips pale, and is apparently suffering great pain. Lungs are clear.

Heart.—There is a marked systolic murmur at the apex.

Abdomen.—The hypogastric region is enlarged and large tender bladder is palpable. There is an inguinal hernia on the right side and the right testicle is enlarged.

Rectal.—The prostate is very much enlarged, smooth, firm, but not extremely hard, and the upper border is difficult to reach. The seminal vesicles cannot be felt.

Urethral.—The patient is unable to void urine, and has had complete retention since yesterday. A catheter is passed with ease and 1000 cc. urine withdrawn.

Cystoscopy.—Record lost.

Preliminary treatment.—A permanent catheter was fastened in the urethra for continuous drainage. Patient was given urotropin and water in abundance. He suffered considerably from paroxymal pains in the bladder. He was very weak and there was considerable puffiness of the eyelids.

Urinalysis.—Very bloody, 1016, alkaline, considerable albumin, many pus cells, red blood corpuscles, no casts. Total urea 11.3 gm. After three weeks the patient's condition was still bad, he suffered pain and tenderness over the bladder, 1200 cc. urine was secreted daily, and occasionally granular casts were found. The patient was still unable to void urine, and although his condition became desperate it was thought best to perform perineal prostatectomy for drainage. There had been a fever ranging from 100° to 101° and occasionally up to 102°.

Operation, September 24, 1904.—Spinal anesthesia, cocaine ⅓ of a grain. Perineal prostatectomy by the usual technique. The lateral lobes which measured 4 x 4 x 5 cm. in size were each enucleated without injury of the urethra or the ejaculatory ducts. Examination showed no median lobe enlargement. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. The patient stood the operation well, his pulse at the end being 95. Spinal anesthesia was entirely satisfactory. Infusion and continuous irrigation on return to ward.

Convalescence.—The patient reacted well, there was no nausea, no headache, pulse did not go above 100° and the patient was comfortable and drank water in abundance. The temperature rose to 99.6° on the day after the operation, and returned to normal on the fourth day. Later on there was a slight temperature (100.7°) for a few days, but the convalescence was uninterrupted. The irrigation was discontinued on the second day, when the gauze and catheters were removed, and the patient was placed in a chair. The urine came through the anterior urethra on the second day after the operation and the perineal fistula closed completely on the 12th day. The patient was discharged from the hospital on the 21st day. His general condition was fair and improving. The wound had been closed for nine days, and he was free from pain. Urine was voided naturally but frequently and his control was weak.

February 22, 1906.—Report by daughter. The wound remained healed and the patient voided urine naturally without pain, only once at night and at normal intervals in the day. On January 12, 1905, the patient had an apoplectic stroke and he died February 12, 1905. He was perfectly cured of his urinary trouble.

Pathological report.—The specimen, G. U. 99, consists of the two lateral lobes removed in five pieces, and weighs about 33 gm. The left

lobe has been removed in one piece and measures 5 x 3.5 x 2.5 cm., and weighs 19 gm. It is smooth, firm but elastic, and is not lobulated. The sections show considerable gland tissue with a few dilated ducts and a small amount of stroma. The right lobe has been removed in four pieces and weighs 14 gm. In general, the appearance is the same as that of the left. No mucosa, no ejaculatory ducts, no calculi removed.

Microscopic examination.—The hypertrophy is of the glandular type with moderate dilatation of the ducts, some cystic degeneration, and in areas quite marked evidence of glandular proliferation. The glandular tissue is partly arranged in lobules, but even outside these lobular areas the tissue is quite rich in acini. The stroma is mostly composed of fibrous tissue, but there is a fair amount of smooth muscle present. Some chronic prostatitis.

CASE 50.—*Moderate enlargement of lateral, median and anterior lobes. Residual urine 1100 cc. Atonic bladder. Imperfect result. Residuum 300 cc. Bottini operation, slight improvement. Ultimate result: Catheter not used. Urination satisfactory but frequent. Followed 18 months.*

No. 722. M. G., age 71, widower, admitted September 7, 1904.

Complaint.—" Bladder trouble."

No history of gonorrhœa.

Present illness began about 30 years ago with slight difficulty of urination, this gradually increased and for the past 25 years the patient has had to arise from 10 to 12 times at night to urinate. About five years ago he had complete retention of urine and had to be catheterized, but has never been catheterized since. The amount voided each time is small and generally accompanied by pain in the penis.

S. P.—The patient voids urine about six times during the night and about as often in the day. He has no incontinence, but the stream is small and slow and accompanied by slight pain in the bladder and penis. He is very short of breath, and he has lost 20 pounds in weight.

Sexual powers.—He has had no erections or sexual desire for several years.

Examination.—The patient is well nourished and his lips are of good color. Pulse 92 to the minute, regular, of good volume and good tension and the vessel wall is not palpable. The lungs are negative. The region of cardiac dullness extends upward to the third rib and outward to the nipple line. The sounds at the apex and base are clear, but distant. Abdominal examination is negative. Large inguinal hernias are present. Genitalia are negative. The prostate is slightly enlarged, soft, smooth, and elastic; no induration in the region of the seminal vesicles.

Cystoscopic examination.—A catheter passes with ease withdrawing 1100 cc. residual urine. Bladder tonicity is very poor. The cystoscope shows a slight median bar behind which both ureters can be seen; moderately hypertrophied lateral lobes, and a small but prominent anterior lobe which is separated from the lateral lobes by a sulcus on each side (but more continuous with the left than the right). The bladder is considerably trabeculated, but not inflamed.

Urinalysis.—The urine is clear, contains no pus cells or bacteria. Complete analysis lost.

September 22.—After two weeks catheterization the urinalysis was as follows: The total amount voided in 24 hours was 2100 cc. Urea 5.5 gr. Urine, acid, sp. gr. 1010, albumin in small amount. Microscopically, red blood corpuscles, epithelium, no casts.

On September 22, total amount of urine 2700 cc. Urea 7.5 gr. Sp. gr. 1009, acid, albumin in small amount.

Preliminary treatment.—The patient was catheterized three times a day for 20 days. Under this treatment the patient improved. Shortness of breath became much less, the urine of better specific gravity and the patient stronger. He was able to void urine in amounts varying from 90 to 120 cc., but residual urine from 1100 to 1500 cc. was constantly present at first. After three weeks catheterization his residual urine varied from 640 to 900 cc.

Operation, September 27, 1904.—Spinal cocainization. Perineal prostatectomy by the usual technique. Lumbar puncture was made between the third and fourth vertebræ and after the spinal fluid had begun to flow a syringe containing one-third gr. of cocaine was attached to the needle, the bulb filled with spinal fluid and the cocaine allowed to dissolve for a minute and a half before being injected. The piston was then drawn back and forth two or three times so as to empty the syringe of all cocaine. The patient was put immediately on the table and the operation begun within three minutes. The patient experienced no pain throughout the entire operation. The right lateral lobe was only slightly hypertrophied and was removed in one piece. In removing the left lateral lobe an effort was made to engage the anterior lobe and to remove it in one piece with the left lateral. The amount of tissue removed was distinctly larger than that from the right side but it was impossible to make out distinctly the demarcation between the left and anterior lobe. It was impossible to engage the median bar which was very slight and after the tractor had been removed the finger was introduced and examination seemed to show that the bar was so small and adherent that it was not thought advisable to produce the traumatism necessary to excise it. The urethra and ejaculatory ducts were preserved, a slight tear being made in the right lateral wall of the urethra. The wound was closed with slight packing for the lateral cavities, double tube drainage for the bladder, and continuous irrigation on the table and after return to the ward. The patient's pulse at that time was 96 and his condition was excellent. Submammary infusion of 700 cc. was given.

Convalescence.—The patient did well for the first 24 hours when the temperature rose to 103° and he became somewhat irrational. On the fifth day the temperature was normal and patient comfortable. The gauze was removed 48 hours after the operation and the tubes on the next day. The patient was up in a wheel chair on third day and was walking at the end of a week. Urine passed through the penis on the seventh day, but the perineal fistula was still open on his discharge from the hospital on

the 37th day. Examination at that time showed the patient in excellent condition, free from pain, voiding urine at intervals of from five to six hours, but with some incontinence when walking about. Perineal fistula is about 5 mm. in diameter and unhealthy in appearance. A silver catheter passed into the bladder with ease, meeting no obstruction nor evidence of stricture and finding 200 cc. residual urine and a bladder capacity of 700 cc. The urine was acid and contained pus and bacilli. The fistula is thoroughly curetted with a gimlet curette.

October 29, 1904.—The fistula is now closed.

February 9, 1905.—The patient returned to the hospital. He says that one week ago a small abscess developed in the region of the perineal fistula and was incised by a physician. He voids urine about 12 times during the day and frequently at night, and there is more or less dribbling while he is in bed. He suffers no pain, his general health is improved rapidly, and he has gained 40 pounds in weight.

Examination.—The perineal fistula persists, a few drops escaping through it.

Rectal examination.—In the region of the prostate is a cicatrix much smaller than the normal prostate. There is no unusual induration and the seminal vesicles are not enlarged. The silver catheter passes with ease and finds 400 cc. residual urine. The vesical tonicity seems fairly good. The cystoscope shows very little trabeculation and no pouch formation. A small median bar is present with a definite bas fond behind it, but it is possible to see the ureters and the interureteral bar. A slight enlargement of the left lateral lobe is present. The anterior lobe is absent. With the finger in the rectum and cystoscope in the urethra a definite increase in the median portion of the prostate is felt. The total length of the enlargement being about 2 cm.

Note.—In reviewing this history it seemed evident that the small median bar which had not been removed at operation was responsible for the residual urine, which was present. It therefore seemed advisable to divide this by a Bottini operation.

Operation, February 10, 1905.—Cocaine four per cent in the urethra. Bottini operation with blade No. 2, 1.2 cm. high. Two cuts, one posterior 1.5 cm. long and one left lateral 1.4 cm. long, a current of 45 amperes being used, blade almost at white heat. Two minutes were consumed in each cut; the operation was performed under the control of a finger in the rectum and the amount of tissue in the median portion seemed to be so slight that very short cuts were made. Immediately after the operation the patient voided 25 cc. of the 200 cc. which had been injected in the bladder.

Convalescence.—There was no rise of temperature after the operation, and very little hemorrhage. The patient was walking about on the second day, and he left the hospital on the eighth day, at which time the fistula was closed, and the patient was voiding much more easily and his condition was excellent. A catheter passed with ease, but found 300 cc. residual urine.

March 23, 1905.—The patient says that after he returned home he passed

numerous sloughs and had two fairly considerable hemorrhages. He is much improved, he can frequently hold urine for three hours during the day, and at night sleeps three or four hours without urinating. A pin point fistula is still present through which a few drops still escape. He has complete control and has no incontinence, and no dribbbling. His general health is excellent. A catheter passes with ease and finds 250 cc. residual urine. The bladder capacity is 740 cc. and the tonicity is poor. Kollmann dilator passes with ease and can be dilated up to 35 F. without meeting any resistance, and causing very little hemorrhage.

February 5, 1906.—Letter. The fistula closed about 10 days after I last saw you (March 23, 1905), and has remained healed. I void urine naturally about a dozen times during the day and six times at night, from one-quarter to three-quarters of a pint at a time. Urination is free and satisfactory. The amount passed in 24 hours is three quarts. I have no incontinence, but there is a slight dribbling at the end of urination, a few drops. My general health is fair, and the result of the operation is entirely satisfactory.

Pathological report.—The specimen, G. U. 100, consists of the two lateral lobes of the prostate removed in five pieces, and weighing in all G-14. The right lobe is in two pieces and weighs G-6. The tissue is elastic, but rather firm, in places lobulated and in others smooth. On section the surface is homogeneous except for small, dilated acini. The entire lobe measures 3 x 2.5 x 1.5 cm. The left lobe is in three pieces, weighs G-8, and measures in all 3.5 x 3 x 2.5 cm. It is similar in appearance to the right, there being considerable stroma and a rather thick capsule.

Microscopic examination.—The hypertrophy is a glandular one although there is present in areas considerable stroma. The acini are moderately dilated with occasional cystic dilatation. The lumina of the culs-de-sac show the usual intraacinous papillomatous-like proliferation. The stroma contains a fair amount of muscle, but the connective tissue is somewhat in excess. There is present quite a marked prostatitis with areas of much periacinous inflammatory tissue formation. The arteries show practically no thickening.

CASE 51.—*Small rounded median lobe. Residuum 50 cc. Bladder contracted—capacity 140 cc. Left hospital much improved. Recurrence of obstruction four months later.*

No. 1328. F. H., age 67, married, admitted August 1, 1904.

Complaint.—"Inability to pass urine."

No history of gonorrhœa.

Present illness began two years ago with difficulty of micturition. Since then there has been considerable straining and increased frequency of urination, but he got along well until 10 days ago when complete retention of urine came on, requiring catheterization. Since then he has voided voluntarily, but at intervals of from 10 to 15 minutes. He has lost about 20 pounds during the past year. Sexual powers lost, no intercourse for one year.

Examination.—The patient is a thin, nervous-looking man.

Genitalia.—A small hydrocele is present on both sides. A large femoral hernia is present in the right groin.

Rectal.—The prostate is only slightly but equilaterally enlarged, rounded, smooth, elastic, except at the upper end where there is induration on both sides. The seminal vesicles are not palpable, and there are no glands to be felt. The rectal mucosa is soft and not adherent.

Cystoscopic.—A coudè catheter passes with ease and finds only 20 cc. residual urine. The bladder capacity is 140 cc. The cystoscope shows a small sessile rounded median lobe with a deep sulcus on each side. The lateral lobes are not enlarged. In the base of the bladder an irregular mass, dark brown in color is seen, probably an old blood clot breaking up. No evidence of vesical tumor is present. With finger in rectum and cystoscope in urethra a slight increase in the median portion of the prostate is detected.

Urinalysis.—Clear, 1007, acid, no sugar, albumin, a trace. Microscopically, pus in small amount, and a few granular casts.

Preliminary treatment.—Urotropin, water, intravesical irrigations, and occasional catheterization. The patient continued to pass urine very frequently in small amount and with difficulty, but the catheter found only from 20 to 50 cc. residual urine. Attempts were made to dilate the bladder by hydraulic pressure, but without success, and at the end of two months the patient's condition was the same as on entrance, and although there was very little residual urine, prostatectomy was decided upon.

Operation, September 30, 1904.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were quite adherent and had to be dissected from the capsule and urethra. The median lobe was drawn down by the tractor so that it presented suburethrally, but it was easily removed through one of the lateral cavities, only a small tear being made. The usual closure was made with double tube drainage and light packs for the lateral cavities. The patient stood the operation well. Pulse at the end 105°. Continuous irrigation on return to ward.

Convalescence.—The patient reacted well. The temperature rose to 100.5° two days after the operation, but remained normal after the fourth day. Gauze and tubes were removed within 48 hours, and the patient was out of bed and in good condition three days after the operation. The perineal wound healed completely within 20 days, and the urine was voided in a large stream. The bladder capacity had increased to 340 cc.

On the 22d day an operation for femoral hernia was performed. Following this operation the patient had bronchitis, and a temperature of 102.7°, but after five days the temperature remained normal, and the patient was discharged November 26. Examination showed no residual urine, and a bladder capacity of 300 cc. Urine voided in a large stream with perfect control, at intervals of an hour. Urine acid, albumin a trace, sp. gr. 1020; microscopically, pus cells. General condition excellent. The cystoscope shows a practically normal prostatic orifice.

May 19, 1906.—Family report that the patient committed suicide January, 1905, about four months after the operation. They report that urination was not entirely satisfactory, as he voided frequently and suffered pain. Several days before death urine was coming in driblets at very frequent intervals, and he was catheterized by a physician who reports that he found about half a pint of urine present. After that the patient voided fairly well for two or three days, when urination again became difficult and catheterization was again necessary. Two days later he committed suicide.

Pathological report.—The specimen, G. U. 103, consists of the two lateral lobes each in one piece and the middle lobe in two pieces, and weighs 13 gm. The right lobe measures 2.5 x 2 x 1.5 cm., is somewhat irregular, elastic, and on section shows a fairly thick capsule and gland tissue with considerable stroma; it weighs 4 gm. The left lobe weighs 5 gm., measures 3 x 2.5 x 1.5 cm., feels harder than the right, but on cross section considerable gland tissue is evident. The median lobe weighs 4 gm. and measures 2.5 x 2 x 1.5 cm. On section several cavities filled with bloody secretion are seen. No mucous membrane, no ducts, no calculus.

Microscopic examination.—The tissue of the left and middle lobes presents small circumscribed areas of typical adenomatous hypertrophy, but there is more stroma as a whole than gland tissue. The fibrous tissue predominates in the stroma. Some areas of prostatitis are present. In the right lateral lobe the amount of gland tissue present is insignificant. Many of the acini are small and compressed, while the stroma is largely composed of fibrous tissue. Some areas of round cell and polynuclear cell infiltration. The hypertrophy in the right lateral lobe is of a distinctly fibromuscular type, while that in the middle and left lobes is mixed, both fibro-muscular and glandular elements being present in varying proportions.

CASE 52.—*Moderate hypertrophy of median and lateral lobes. Slight uremia six months. Nausea and vomiting. Operation to supply drainage. Death on fourteenth day. Autopsy. Double pyonephrosis.*

No. 801. W. W., age 65, married, admitted September 20, 1904.

Complaint.—"Difficulty of urination."

No history of gonorrhœa.

Present illness began three years ago with difficulty in urination. About the same time he began to suffer pain in the region of the right kidney. The obstruction to urination became gradually greater, and during the last six months he has voided urine about every hour night and day, and has frequently suffered considerable pain before and after urination. During the past three months he has suffered with considerable nausea, vomiting, and lack of appetite. His physician writes that he thinks he has been constantly uremic during this time. He has lost considerably in strength and weight (30 pounds), but never had complete retention of urine until yesterday, when attempts of his physician to pass filiforms and catheters were unsuccessful.

S. P.—The patient is unable to void except a few drops at a time and with difficulty. He is quite ill, has severe nausea and vomiting.

Examination.—The patient looks very sick, is retching frequently, and his breath has a strong urinary odor. Pulse is 112, hard, intermittent.

Chest.—The breathing is mostly abdominal. The percussion note is hyperresonant.

Heart.—The heart is quite irregular, and there is a systolic murmur at apex. The heart sounds are feeble. The abdomen is distended, and a dilated bladder is felt which reaches to the umbilicus.

Rectal.—The prostate is very much enlarged, the right lobe is the larger, it is smooth, regular, firm, but elastic; no nodules or glands made out. The seminal vesicles are negative.

Preliminary treatment.—On admission an attempt at catheterization was made, but without success, owing to a false passage in the region of the membranous urethra. Suprapubic aspiration was performed, but only 240 cc. were removed. An infusion of 800 cc. was given on account of vomiting.

September 21, 1904.—The patient is still nauseated and refuses nourishment. He was successfully catheterized to-day, 940 cc. urine being evacuated. Retention catheter was provided.

Urinalysis.—1008, acid, no sugar, albumin a trace; microscopically, blood cells.

September 22, 1904.—Patient uncomfortable, vomits small amounts, temperature 99°, pulse 88. Drainage 2260 cc. Liquid diet. Salt solution and coffee per rectum.

September 24.—Nausea and vomiting continue. Drainage 1860 cc. Sp. gr. 1007, urea 13 gm. per liter.

September 25.—More comfortable, less nausea. Drainage 2880 cc.

September 27.—Fairly comfortable day. Temperature 98.2°, pulse 104. Enjoys his meals.

September 28.—Has taken a turn for the worse to-day. Has been in a stupor much of the time and vomited considerably. Complains of pain in urethra and bladder. Refuses nourishment. Salt solution and potassium citrate have been continued daily, 1600 cc. being given.

September 30.—Patient still has nausea and refuses nourishment. Temperature 99°, pulse 100. Drainage 2560 cc. Sp. gr. 1010, albumin a trace. Microscopically, pus cells, but no casts. Total urea 30 gm.

Note.—The patient is not improving under continuous drainage. The urethra has become very irritable, and the catheter causes pain. It is thought best to supply perineal drainage, although the hope of curing the patient is not good.

Operation, September 30, 1904.—Spinal anesthesia. Perineal prostatectomy by the usual technique. One-third of a grain of cocaine was used and with perfect success. Two moderately enlarged lateral lobes were easily enucleated, only a small tear being made in the urethra on one side. There was a small median enlargement which was removed. The wound was closed as usual with double tube drainage and light packs for

the lateral cavities. The pulse was bad during part of the operation, reaching 160, but it became better towards the end (130). His condition at the end was fair. Infusion on table. Continuous irrigation on return to ward.

Convalescence.—Gauze removed in 24 hours, tubes in 48 hours. Patient is fairly comfortable, pulse 96 to 120, small and irregular. Infusion 700 cc.

October 4, 1904.—Uncomfortable, nauseated, vomiting. Nourishment refused. Temperature subnormal, pulse 100.

October 6, 1904.—Patient weak, vomiting continuous. Pulse 100, but weak, temperature 96.8° to 98°. Daily infusions. Excreting urine freely. Wound looks well.

October 10.—Vomiting and nausea continue. Rectum is intolerant to nutritive enemata. Is getting very little nourishment and becoming very weak. Temperature 96.9° to 97°, pulse 116. Urine drains freely from the perineal wound.

October 13, A. M.—The patient has continued to grow worse. Stomach and rectum are both intolerant. He has had no nourishment for several days. Pulse small, intermittent. Temperature 95.8° to 98°. Hiccough, nausea and vomiting.

P. M.—Because of impossibility of getting either water or nourishment into the patient by stomach, bowels or rectum, it was decided to attempt to feed him through a high enterostomy. Accordingly, under cocaine anesthesia an incision was made in the median line above the umbilicus, and the first loup of small bowel presenting was sutured into the wound preparatory to enterostomy. The patient stood the operation very poorly, and died two hours later before the intestine had been opened.

Autopsy.—Autopsy showed double hydropyonephrosis. The kidney pelves were greatly dilated and the ureters were each the size of the thumb. There was a marked inflammation present, evidently of old standing. There were emphysema of the lungs, chronic fibrous myocarditis and maculæ tendinæ.

Note.—Operation was attempted in this case only as a last resort. It is evident that nothing could have saved him.

Pathological report.—The specimen, G. U. 101, consists of the median and lateral lobes of the prostate removed in four large and two small pieces, and weighing 55 gm. The right lobe measures 5.5 x 4 x 3.5 cm. and weighs 32 gm. and consists of two large and two small pieces with a small area of adherent mucosa. On cross section the condensation of fibrous tissue at the periphery with capsule formation is moderate. Lobulation and gland hypertrophy are quite evident on the cut surface, and the glands in places are filled with a brownish green soft matter which exudes on squeezing, and which contains microscopically many lecithins, many fine deeply staining granules, a few pus cells, and granular debris. The left lobe measures 5 x 3 x 2 cm. and weighs 23 gm. The middle lobe measures 3 x 2.5 x 2.5 cm. and weighs 10 gm. Characteristics similar to right.

Microscopic examination.—The hypertrophy is a moderately glandular one. Some arrangement of the acini in lobules, the stroma in these areas being small in amount and largely of connective tissue. In other portions the bands of stroma between the acini are rather broad. The stroma contains more connective tissue than muscle, and there is a formation of considerable embryonic tissue. There are some areas of prostatitis. The arteries are moderately thickened.

CASE 53.—*Slight fibrous hypertrophy of prostate associated with stricture of urethra. Followed 20 months.*

No. 601. L. S., age 71, married, admitted April 15, 1904.

Complaint.—" Stricture of urethra. Catheter life."

Patient had gonorrhœa twice in his youth, but thinks he was entirely cured. Has been married for 38 years and is the father of two children. A stricture developed 35 years ago and he received dilatation.

Present illness began about five years ago with increased frequency of urination, which gradually increased, but giving very little trouble until January, 1903, when complete retention of urine came on. He was then catheterized for 10 days, but after that voided naturally, but frequently. A second retention came on in November, 1903, and a third in January, 1904, and since then he has had to use a catheter once or twice a day.

S. P.—The patient is unable to void more than a few drops of urine. He uses a catheter twice a day, suffers no pain, and is quite comfortable.

Sexual powers.—He has had no sexual desire for five years and no intercourse, although occasionally there is a slight erection in the morning.

Examination.—The patient is poorly nourished. Lips of fair color. Chest and abdomen are negative.

Rectal.—The prostate is slightly enlarged on the left side, but does not bulge into the rectum, the enlargement being chiefly lateral. The right lobe of the prostate is not enlarged. The consistence is firm, but not hard, not tender. The left seminal vesicle is slightly indurated, the right is not.

Urinalysis.—Acid. Sp. gr. 1010, albumin a slight cloud. Microscopically, pus cells and bacilli.

Urethral.—There is a tight hard stricture 3 cm. distance from the meatus, through which a No. 19 F. sound passes with difficulty, but after that meets no obstruction. Internal urethrotomy performed.

May 30, 1904.—The patient has been treated by gradual dilatation with sounds. There is still considerable induration at the site of the stricture but a No. 28 French sound will pass.

Cystoscopic examination.—A large silver catheter passes with ease, the bladder is large, the tonicity good. Retention of urine complete. The cystoscope shows a definite collar of hypertrophied prostate around the entire orifice forming a circular ring which is most evident anteriorly. There are no clefts and no lobular projections. The median portion of the prostate is moderately thickened and there is a pouch behind it, but the ureters can be seen with ease and are apparently normal. The bladder is

considerably trabeculated with numerous pouches and several definite diverticula. With finger in rectum and cystoscope in urethra there is only slight thickening of the median portion made out.

October 4, 1904.—The condition of the patient remains the same. He can void very little naturally and uses the catheter two or three times daily. Occasionally he suffers considerably from cystitis. He has not had erections for a long time. The cystoscope shows a circular collar of slight but definite thickness around the entire orifice, as described at the first cystoscopy. Bottini operation would be probably curative, but owing to the small size of the prostate per rectum, it would probably be a hazardous procedure. Perineal prostatectomy was therefore advised. He has been dilated with sounds and the Kollmann dilator for months without benefit. The urethra is now of large caliber, but there is still considerable induration.

Operation, October 6, 1904.—Ether. Perineal prostatectomy by the usual technique, except that the ejaculatory bridge was divided and the median portion of the prostate removed suburethrally. The prostate was extremely small, fibrous, very adherent to the capsule and urethra. The median portion was so intimately adherent and so fibrous that it was impossible to remove it through the lateral cavities, and in view of the absence of sexual powers it was thought advisable to excise the median portion directly through the ejaculatory bridge which was done with ease. The amount of tissue removed was small, but nothing remained except the mucous membrane which was preserved. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. Patient stood the operation well, pulse at the end being 96. Continuous irrigation was begun on return to the ward.

Convalescence.—The patient reacted well. The highest temperature after the operation was 99.6° on the third day and it was normal after the fifth day. The tubes were removed in 36 and the gauze within 38 hours. Urine began to come through the urethra on the fourth day, and the patient was up in a chair on the eighth day. On the 20th day the condition was excellent, but the fistula was not yet healed. On the next day epididymitis began on the right side, the temperature rose to 102°. The swelling went on the suppuration and had to be opened November 9, considerable pus being evacuated. Previous to this the patient looked very sick, his temperature reached 102° almost every day and on November 9, the pulse was extremely weak, 160 to the minute and the patient was drowsy. After evacuation of the pus from the epididymis the patient improved steadily, but slowly, and he left the hospital on December 16, 1904. The perineal fistula was not closed, but most of the urine passed through the urethra. He had not required catheterization since the operation. There was no incontinence.

January 5, 1905.—The patient voids urine naturally, but a pin-point fistula is still present although it has been curetted several times. The

urethra has been dilated. A stricture of large caliber is present, but a No. 28 sound will pass.

November 30, 1905.—Letter. The fistula is closed. I void urine naturally six or eight times during the day, three or four at night, about one-quarter of a pint at a time. I have a slight scalding in the urethra during urination. I have no erections (they were absent before operation). I have had no treatment and my general health is excellent. I have gained 30 pounds in weight.

February 8, 1906.—The stricture of the urethra seems to be coming again. Following your request I passed a catheter for the first time since leaving the hospital. A number 18 catheter passed with difficulty and considerable pain through the stricture. There were about four ounces of residual urine. I void from one-fourth to one-half a pint of urine at a time, and sometimes do not urinate but twice during the night.

The patient was advised to dilate the stricture, as it is evident that this is the cause of the imperfect result.

May 16, 1906.—Letter. The only thing that I can complain of is a slight return of the stricture, but I have not passed a sound or a catheter since February. I void urine naturally about every two hours in the day time and about twice at night. At times there is a scalding pain. I do not have erections. I have had no treatment since the operation. My general health is good, and I have gained 35 pounds in weight. I am very much improved.

Pathological report.—The specimen, G. U. 105, consists of three pieces, the median and two lateral lobes, and weighs in all G-4. The right lobe measures 1.5 x 1.5 x 1 cm. The tissue is firm, but elastic, and on section shows considerable fibrous tissue, but some evidence of glandular tissue is present. The left lobe measures 2 x 1.5 x 1 cm., weighs G-2, and is similar in appearance to the right. The median bar measures 1.7 x .8 x .5 cm. and weighs G-1. A small area of urethral mucosa is attached to it. On section it seems to be composed largely of fibrous tissue. The lumina of the ejaculatory ducts are seen in the lower portion.

Microscopic examination.—In the right lobe the hypertrophy is a moderately glandular one, the acini being irregularly distributed through the stroma without any tendency to lobular formation. In the left and middle lobes the amount of the adenomatous tissue is considerably less; altogether there is more gland tissue than stroma. The acini are grouped together in areas, the lumina at times being fairly regular, at other times showing marked complexity. There is considerable young connective tissue in the stroma. In the middle bar there is a considerable area which is infiltrated with some leucocytes, round cells and numerous polyblastic cells with the formation of numerous new blood-vessels. There are present very few acini in the section from the median portion, but there is present a very considerable interstitial prostatitis.

CASE 54.—*Moderate hypertrophy of median and lateral lobes. Symptoms suggesting stone. None found. Cystoscopy unsuccessful. Cure of obstruction. Slight burning pain. Followed 1¼ months.*

No. 769. S. R., age 76, widower, admitted October 4, 1904.

Complaint.—" Frequent urination."

No history of gonorrhœa.

Present illness began 18 months ago with nocturnal frequency of urination which rapidly increased until the patient had to arise 25 times during the night. During the day he did not have to urinate so frequently, only six or eight times. He suffered burning pain during urination. About a year ago his physician began the use of a catheter and vesical irrigation, and since then the catheter has been necessary every day, but he has always been able to void a small amount. Occasionally he has had pains in the right side, but no chills or fever. His general health has been good, but he has suffered very greatly.

S. P.—The bladder is small, urination difficult and painful, and the catheter required every two hours, but this does not give him relief.

Examination.—Patient is a large well nourished man with lips of good color. The heart is enlarged, but the sounds are clear. The arteries are sclerotic and the abdomen is negative except in the lower portion where there is considerable tenderness over the bladder.

Rectal.—The prostate is moderately hypertrophied, rounded, somewhat nodular and fairly hard.

Urinalysis.—Cloudy, 1020, acid, no sugar, a trace of albumin. Total amount in 24 hours, 640 cc. Total urea G-6.4.

Cystoscopic.—A soft rubber catheter passes with ease. The urethral length is 11 inches. Very little urine is obtained. The bladder capacity is contracted, being only 200 cc. It is irritable and instrumentation causes great pain. Hemorrhage is produced and cystoscopy is therefore impossible.

Preliminary treatment.—Rubber catheter was fastened in the urethra and urine allowed to drain continually into a bottle. The patient was instructed to drink water in great amount and was given purgatives and urotropin. After four days the patient's condition had distinctly improved, the amount of urine had increased daily and the total urea was 22.4 gr. Total amount of urine 2240 cc.

Operation, October 8, 1904.—Spinal cocainization. Perineal prostatectomy by the usual technique. One-third of a grain of cocaine was injected into the spinal canal after being dissolved in the spinal fluid drawn out into the barrel of the syringe. The lateral lobes were enucleated with ease and measured 3 x 4 x 5 cm. in size. The middle lobe was then caught with the tractor, delivered into the right capsular cavity and easily enucleated. It was smooth, globular, 2½ cm. in diameter. The wound was closed as usual with double catheter drainage, light gauze packs for the lateral cavities. The pulse before the operation was 95, the blood pressure 215. At the end of the operation the pulse was 105 and the blood pressure 195.

As soon as patient was removed from table a condition of collapse came on, pulse imperceptible at wrist. Blood pressure fell to 80 and the patient became unconscious. An intravenous injection of 500 cc. salt solution and strychnine .1 grains was given, but he did not react for about half an hour and his condition at one time seemed desperate. On return to ward his pulse was 136, and he was still slightly irrational. In the evening he had a chill and a temperature of 101° and on the next day a temperature of 102°; after that, however, his temperature fell to normal and he had no further elevation, and the convalescence was entirely satisfactory. The gauze was removed on the day after the operation and the tubes on the next day. He was up in a chair on the seventh day in good condition. On the 10th day he was walking about the ward. The perineal fistula closed completely on the 18th day, and the patient left the hospital on the 28th day. His condition then was excellent, and the wound closed. He was able to retain urine four hours during the day, but voided more frequently during the night; there was no incontinence, but some urgency of urination. Silver catheter passed with ease, residual urine 10 cc., bladder capacity 320 cc. Urine, acid, moderately purulent. Advised to take urotropin, water in abundance and to dilate bladder by retaining his urine as long as possible.

February 1, 1905.—During the day I void urine three or four times in 12 hours and at night two or three times in 12 hours. Urination is normal and the amount voided of good quantity. I have no pain except a slight scalding. Erections have not returned. (Absent two years before operation.)

November 22, 1905.—I have slight scalding pain when voiding urine, occasionally it is acute. While I am still or sitting I feel no inconvenience, but almost the moment I get up I have a desire to urinate. I retire at ten o'clock and sleep until four, when I awake with the pain spoken of above.

December 12, 1905.—I have had no treatment. The wound has remained closed. I void urine naturally in the ordinary amounts, six to eight times during the day and twice at night. I suffer a scalding pain when the bladder is nearly empty. No erections. My health is excellent and I have gained 30 pounds.

Pathological report.—The specimen, G. U. 107, consists of the three lobes of the prostate removed in four pieces, and weighs G-32. The right lobe weighs G-10, and measures 4.5 x 2.5 x 2 cm; is lobulated and elastic. There is considerable peripheral condensation of the fibrous tissue. The cut surface shows moderate amount of dilated ducts, and only a small amount of stroma. The left lobe weighs G-18, and measures 5 x 3.5 x 3 cm. It is similar in character to the right. The middle lobe weighs G-4, and measures 3 x 2.5 x 2 cm. It is oval, smooth, encapsulated, and on section shows considerable gland tissue and numerous dilated acini. No mucous membrane, no ejaculatory ducts, no calculus.

Microscopic examination.—The hypertrophy is a very glandular one,

the gland tissue being for the most part arranged in lobules. In many of these glandular lobules the stroma is very insignificant in amount, and the acini are rather small, only an occasional dilated one being seen. There is, however, very marked intraacinous proliferation and numerous papillomatous projections into the lumina of the acini. The epithelium lining the acini varies a great deal, at times consisting of two layers, an internal very high columnar and an external more cuboidal type of cell. At other times the epithelium is many layers deep, but the internal layer is nearly always of the high columnar type. The interspheroidal tissue contains comparatively few acini and these are compressed. The stroma consists mostly of connective tissue, the amount of smooth muscle being insignificant. The blood-vessels show practically no thickening and there is very little prostatitis present in the sections examined.

CASE 55.—*Considerable enlargement of median and lateral lobes. Dribbling of urine for seven years. Cure. Followed six months.*

No. 743. A. R., age 78, admitted October 9, 1904.

On invitation of Major Arthur, this patient was operated upon at the Soldiers' Home at Washington.

Complaint.—" Difficult and frequent urination and incontinence."

Gonorrhœa three times with orchitis on left side during the last attack.

Present illness began 10 years ago with difficulty and frequency of urination, especially at night. After that the size of the stream became progressively smaller, urination more difficult and frequent, and for seven years he has had almost constant dribbling of urine. No complete retention, no hematuria, burning on urination.

S. P.—There is almost constant dribbling and the patient has to void eight or ten times during the night.

Examination.—The patient is a well nourished man. Lungs, heart, and abdomen are negative.

Rectal.—Prostate is considerably enlarged, smooth, elastic.

Urethral.—There is a stricture of moderate degree about 4 cm. from the meatus.

Vesical.—A catheter passes with ease and finds 95 cc. residual urine. (The patient has been catheterized twice daily for four days, and from 65 to 125 cc. residual urine obtained.)

Urinalysis.—Cloudy, sp. gr. varied from 1005 to 1013. At times acid, at others alkaline. There is a trace of albumin, no sugar, numerous pus cells, and a few hyaline casts. The total quantity varies from 1100 to 1600 cc. daily.

Operation, October 9, 1904.—Spinal anesthesia. Perineal prostatectomy by the usual technique. Two fairly large lateral lobes were easily enucleated, the urethra being torn. The median bar was removed by the suburethral method after intentional division across the ejaculatory ducts. It measured 2 x 2 x 3 cm. No mucous membrane was removed.

The wound was closed as usual with double tube drainage and light packs for the lateral cavities. The patient stood the operation well. The

anesthesia was successful. A submammary infusion was given on return to room. The tubes were accidently pulled out immediately after the operation and were not replaced.

Convalescence.—The patient reacted well. The temperature remained normal with the exception of an elevation to 100.8° six hours after the operation. Urine passed through the anterior urethra nine days after the operation, and on the 16th day the patient voided 80 cc. at a time through the anterior urethra. Epididymitis developed on the right side on the 17th day and led to abscess formation which was incised on the 22d day.

November 23, 1904.—Pin point fistula persists, but at times there is no leakage through it. Urination is still frequent and is associated with burning. He voids from four to six times every night.

March 21, 1905.—The patient is able to hold urine for six hours without discomfort during the day, but during the night must urinate from three to six times. The fistula closes at times for three days and then opens again, causing him considerable discomfort.

April 3, 1905.—The patient had been for a long time in a very despondent frame of mind. Yesterday he went off into the woods, drank carbolic acid and was found dead. Post-mortem examination showed the bladder in excellent condition, the prostate scarcely perceptible, and a very small sinuous urethral fistula. He had improved immensely and was steadily getting better. Letter from Major Arthur.

Pathological report.—The specimen, G. U. 106, consists of the lateral and median portions of the prostate removed each in one piece. The lateral lobes measure about 2 x 2 x 4 cm. and present the typical picture of adenomatous hypertrophy. The median lobe measures 2 x 2 x 3 cm.; it is similar in character to the others. No mucous membrane is attached. The ejaculatory ducts are not seen.

Microscopic examination.—A section made from prostatic tissue removed at autopsy shows a lobulated moderately glandular hypertrophy. There is present a rather marked prostatitis with the formation of a large amount of interstitial fibrous tissue. The acini are mostly small and filled with proliferating and desquamated epithelial cells and leucocytes. At times the acini are rather closely aggregated, but at other times they are separated by rather broad bands of stroma. The primary glandular hypertrophy in this case is evidently undergoing considerable change as a result of inflammatory hyperplasia. The blood vessels show a considerable degree of thickening.

Case 56.[11]—*Considerable enlargement of median and lateral lobes. Cure. Followed two years.*

No. 472. A. R., age 61, married, admitted October 11, 1903.

Complaint.—" Bladder trouble."

Gonorrhœa six times. No sequelæ.

Present illness began about nine years ago with slight difficulty at the

[11] This case should have been No. 16.

beginning of urination. Four years later the difficulty had become considerable and he consulted a physician who passed a catheter and drew off residual urine. Since then difficulty and frequency of urination have increased. Two months ago patient was treated several times by urethral dilatation with sounds, which was painful and produced hemorrhage.

S. P.—Urination now occurs every two hours during the day and six times at night. He suffers no pain and has no incontinence.

Sexual powers.—Erections are less vigorous than formerly, but intercourse is almost normal.

Examination.—The patient is a sturdy-looking man, lips of good color. The heart is enlarged, but the sounds are clear. The lungs and abdomen are negative.



FIG. 43.—Long pedunculated median lobe, moderate lateral lobes.

Rectal.—The prostate does not bulge at all into the rectum, the posterior surface is flat and does not give at first the impression of being hypertrophied. On careful examination, however, it is found to be broader than normal and it is impossible to find any upper margin.

Urinalysis.—Urine cloudy, acid, 1020, considerable albumin, no sugar. Urea G-6 to the liter. Microscopically, pus cells very numerous.

Cystoscopic.—A coudè catheter passes with ease and finds 200 cc. residual urine. The cystoscope shows large intravesical hypertrophy of both lateral lobes with a deep sulcus between them and on each side. Behind them is a middle lobe which does not seem to be very large. With finger in rectum and cystoscope in urethra, the amount of tissue did not seem to be greater than normal, the cystoscope probably lying in a cleft.

Operation, October 15, 1903.—Spinal anesthesia. Perineal prostatectomy by the usual technique. One-fifth of a grain of dry sterile cocaine was dissolved in the syringe and then injected into the spinal canal. The patient was immediately put on the table and the anesthesia was perfect. The lateral lobes were considerably enlarged and easily enucleated. The middle lobe was removed through the left lateral cavity and proved to be much larger than was expected, being about 2 cm. in diameter and 5 cm. long and markedly pedunculated as shown in Fig. 43. The urethra was not torn and the ejaculatory ducts were preserved. A small tear was made in the vesical mucosa. The wound was closed as usual with double tube drainage for the bladder and the lateral cavities packed with gauze. The patient stood the operation well. His pulse at the end was 120. Two hours later he had a severe chill and his temperature arose to 103.2°. Saline infusion of salt solution was given immediately after return to room and vesical irrigation was begun.

Convalescence.—The gauze was removed on the fourth day and the tubes on the fifth. The patient was in a chair on the eighth day. The perineal fistula closed on the 18th day. The patient was discharged on the 25th day. At that time he was able to retain his urine for three hours and he was free from pain. There was slight incontinence, particularly after coughing.

May 22, 1904.—Letter. I urinate about every four hours, do not get up at all during the night and void a pint in the morning. Micturition is normal. Erections have not returned.

February 1, 1905.—I void urine naturally three or four times during the day, none at night. Erections have returned and sexual intercourse is satisfactory though the erections are not perfect. I am cured.

Pathological report.—The specimen, G. U. 40, consists of three pieces, two lateral lobes measuring each about 5 x 3 x 2 cm. and a middle lobe 4 x 3 x 1.5 cm. in size as shown in the accompanying photograph. (Fig. 43.) The total weight is 65 gr., the middle lobe weighing 20 gr. The external surfaces of the lobes show numerous small spheroids more or less loosely bound together. On section numerous spheroids containing dilated glands are seen, and in the lateral lobes small areas of greenish yellow pus are seen.

Microscopic examination.—The hypertrophy is a distinctly lobulated glandular one. The acini are for the most part dilated with irregular complex lumina. Some cystic degeneration. The epithelium lining the acini is as a rule two layers in depth, but in places there is considerable cell proliferation. The stroma is mostly composed of fibrous tissue, and the arteries show a moderate amount of thickening. Some areas of prostatitis are present.

CASE 57.—*Moderate enlargement of median and lateral lobes. Catheter life several months. Cure.*

No. 750. J. E. C., age 76, widowed, admitted October 15, 1904.

Complaint.—" Prostatic enlargement. Catheterism."

Patient never had gonorrhœa. Ten years ago the patient had renal colic on the left side and passed a small stone. No subsequent attacks until one year ago when he had typical symptoms of renal colic on the left side lasting for three hours, and passed a calculus. No colic since.

Present illness began 10 years ago with a slight difficulty in, and increased frequency of urination. Since then there has been a gradual increase in the symptoms. Retention of urine came on for the first time 14 months ago, and he was then catheterized once a day for four weeks. After that the catheter was not used until the spring of 1904, when he had retention of urine again. For several months he has been more or less dependent upon the catheter. At present he catheterizes himself three or four times a day, finding each time about eight ounces of residual urine. He is able to void only small amounts of urine. He has no pain except when the bladder becomes full. He has erections occasionally and once in a while has a nocturnal emission. Has had no sexual intercourse for 10 years. His general health is excellent.

Examination.—The patient is a sturdy looking man. There is very slight arteriosclerosis. Heart, lungs and abdomen are negative.

Rectal examination shows moderate hypertrophy of the prostate. Median furrow and notch are present. The prostate is round, smooth, elastic, and firmer in the right than in the left lobe. No induration in the region of the seminal vesicles, and no enlarged glands are present. The prostate is about the size of a medium-sized lemon. The urine is cloudy and contains a slight amount of albumin, numerous pus and epithelial cells and bacilli. Sp. gr. 1010.

Cystoscopic examination.—A coudè catheter passes easily and finds 300 cc. residual urine. The bladder capacity is 350 cc. The tonicity is good. The cystoscope shows a small median lobe with a sulcus on each side, and very little intravesical hypertrophy of the lateral lobes. The bladder wall is markedly trabeculated and numerous small pouches and diverticula are seen, especially in the posterior and lateral walls of the bladder. The ureters cannot be seen, being behind the median lobe. With the finger in the rectum and cystoscope in the urethra the amount of tissue in the median portion is considerable, and it is impossible to feel the beak of the cystoscope.

Operation, October 24, 1904.—Ether. Perineal prostatectomy by the usual technique with the exception that after the removal of the two lateral lobes the ejaculatory bridge was intentionally divided transversely as shown in Fig. 31, and the median lobe of the prostate removed. The lateral lobes were easily enucleated, the right being larger than the left. The median enlargement came away in three pieces, the last a sessile intravesical lobule 3 cm. in diameter. Removal of this was accomplished with a finger in the urethra which was considerably lacerated. There was very little hemorrhage and the patient stood the operation well. The wound was closed as usual with gauze packing for the lateral cavities and double drainage tubes in the bladder. Submammary infusion was given on the table.

Convalescence.—The patient reacted well. The gauze was removed on the third day, and continuous irrigation was kept up for three days when the tubes were removed. The patient was out on the fifth day and began to walk on the seventh. Urine began to flow through the penis on the fifth day and he was at once able to hold it for two hours. There was no epididymitis or any other complication. Temperature for three days after operation reached 101.7°.

November 12, 1904.—The patient voids urine about every three hours, mostly through the urethra, but a small amount escapes through the fistula.

November 15, 1904.—The fistula closed on the 19th day. (Closing after the use of the gimlet curette.) The patient voided urine last night at 1.30 o'clock and did not have to urinate again until 6.30 a. m. There is no incontinence. Urine flows in a large stream and without pain. Has had no instrumentation. Discharged from hospital on the 22d day. No stricture, no residual urine present.

January 18, 1905.—Letter. I very seldom urinate during the night, and urination is normal. My general health is excellent.

May 24, 1905.—The urine is clear and passes in a large stream at intervals of five hours during the day and eight hours at night.

November 20, 1905.—Letter. I am happy to state that I have not had a single day's discomfort from my urinary organs since my return home. I do not urinate during the night. Troubled as I was before the operation with having to get up almost every hour during the night, and urinating with great pain, I am one of the happiest of mortals. I have occasional erections at night.

November 30, 1905.—Letter. Wound has remained healed. I void urine perfectly, four to five times a day and none at all during the night, often 10 ounces at a time. I suffer no pain, have erections occasionally. My general health is excellent, and I consider myself cured.

May 7, 1906.—Letter. I urinate at intervals of five or six hours during the day, and after emptying my bladder at bed time do not need to do so again until six or seven o'clock the next morning. The passage of urine is as natural as when a boy. I have erections very rarely. Have not attempted intercourse. There have been no complications since the operation and my health is excellent.

Pathological report.—The specimen, G. U. 111, consists of three pieces, right, left, and median lobes, and weighs about G-20, the lobes being about equal in size, and measuring about 3½ x 2½ x 2 cm. Toward the periphery of the lobes the tissue is more fibrous, forming a fairly definite capsule. In the interior numerous dilated glands are seen. There is no induration or suggestion of malignancy. No mucous membrane nor ejaculatory ducts were removed.

Microscopic examination.—The hypertrophy is a glandular one with some tendency to arrangement in lobules. The acini are for the most part dilated, but do not show the complexity of lumina which one sees in more

glandular prostates. Here and there cystic dilatation of the acini with flattening of the lining epithelium is present. The epithelium lining the acini is usually two layers thick, the superficial being of a tall cylindrical type with the nucleus near the base of the cell, while the layer resting on the basement membrane is more cuboidal. The stroma is dense, and mostly composed of fibrous tissue. Some prostatitis is present in areas. Numerous corpora amylacea are seen in the ducts.

CASE 58.—*Slight enlargement of lateral lobes. Small round median lobe. Small suburethral lobe. Stricture of urethra. Cured. Followed 20 months.*

No. 757. A. H. C., age 62, married, admitted September 23, 1904.

Complaint.—" Bright's disease."

Gonorrhœa at the age of 21, and again two years later.

Present illness began about 10 years ago with slight difficulty in urination, which continued for six years without any marked increase in frequency of urination. During the past year he has had to urinate four times during the night and about 10 times during the day. Micturition is accompanied by considerable straining and at times there is incontinence both night and day. Has never had complete retention of urine nor has he been catheterized.

Sexual powers.—Erections are still present, but the desire is practically nil and ejaculation is painful.

Examination.—The patient is a well nourished man. Lips and mucous membranes of good color. Heart, lungs, and abdomen negative.

Rectal examination.—The prostate is slightly enlarged in both lateral lobes, soft and smooth. The seminal vesicles are not indurated. Slight urethral discharge is present which shows microscopically a few intracellular diplococci, which are not gonococci. Examination of the urethra with bougies-a-boule shows a stricture of moderately small caliber at the penoscrotal juncture. The urine is cloudy in all three glasses and contains considerable amount of pus, but no bacteria. Sp. gr. 1020, acid, albumin a trace. Urea 8 gr. to the liter.

October 20.—The patient has been treated by gradual dilatation of the urethral stricture. The stricture has dilated easily. Filiforms and followers were used at first, but after three weeks a No. 26 sound could be passed with ease. The urine has improved remarkably, and is now clear except for a few shreds. The patient still voids urine four or five times at night, and a catheter finds 210 cc. residual urine.

Cystoscopic examination.—A catheter passes with ease, finds 210 cc. residual urine, and a bladder capacity of 400 cc. and excellent vesical tonicity. The cystoscope shows a fairly large sessile median lobe with a sulcus on each side. The lateral lobes project very little into the bladder, which is considerably trabeculated, hyperæmic but not inflamed. There is no foreign body present. On the floor of the bladder is a prominent transverse ridge separating two deep pouches. The ureters cannot be seen.

Operation, October 24, 1904.—Perineal prostatectomy by the usual technique. The lateral lobes which were only slightly hypertrophied were easily enucleated. The median lobe could not be engaged with the tractor, and when the finger was introduced the lobe was found to be pedunculated in character. The finger was also ineffectual in drawing the lobe into one of the lateral cavities so that it was necessary to use a curved forceps which was inserted through the urethra and made to grapple the lobe which was then drawn into the urethra. While held in this position its right lateral border was exposed by blunt dissection through the right lateral cavity, and it was finally enucleated without removing any of the mucous membrane. Examination then showed a small rounded suburethral lobule which was also enucleated. The ejaculatory ducts were preserved and only two small rents were made in the urethra. The wound was closed as usual with double tube drainage in the bladder and light gauze packs for the lateral cavities. The patient stood the operation well, the pulse being 90 at the end. An infusion and continuous intravesical irrigation were instituted on return of patient to the ward.

Convalescence.—On the day after the operation the temperature rose to 101°, but was practically normal on the next day, and did not rise again. The gauze and tubes were removed on the third day, and interval urination was established at once. On the fourth day most of the urine came through the penis. The patient was out of bed on the fifth day and began walking on the sixth, on which day the perineal fistula healed. He had no complications of any sort and was discharged on the 18th day. At that time he could hold his urine for six hours. The perineal wound had been closed for 12 days, he had perfect control, and his general health was excellent.

Examination, October 12.—The perineal wound is closed, urine is voided in a good stream, silver catheter passes with ease, and there is no residual urine present. Urine is cloudy and contains pus and the patient has a slight urethral discharge. He is advised to take irrigations of bichloride of mercury until this ceases.

February 1, 1905.—Letter. I void naturally three to five times during the day, and once at night. There is no fistula and I consider myself cured. Erections have returned and I have intercourse.

November 30, 1905.—Letter. I void urine naturally and arise only once at night. I have erections but intercourse is not very satisfactory. My general health is splendid, I have gained 20 pounds and I consider myself cured.

May 15, 1906.—Letter. I void urine normally and at normal intervals, about half a pint at a time. I have very little pain. Erections and sexual intercourse are satisfactory. I have had no complications or treatment since operation. I have gained about 30 pounds, and I feel that I am cured.

Pathological report.—The specimen, G. U. 112, consists of the three lobes of the prostate each removed in one piece, and weighs G-27. The right

lateral lobe is the larger, weighs G-13 and measures 4.5 x 3 x 2 cm. Its upper vesical portion is smooth and regularly rounded forming a definite lobe separated from the lower lobulated portions. On section the fibrous capsule is unusually well marked and strips off the prostate with ease. The upper portion is a distinct round lobe 2.5 cm. in diameter. In its central portion there is a small hemorrhagic area with yellowish specks in a grayish field, and slightly suggestive of malignancy. The outer portion of this lobule is quite fibrous. A moderate number of dilated glands are present. The left lobe measures 3 x 2 x 2 cm. in size, is irregular and shows considerable fibrous stroma. The median lobe is about 2.5 x 2 x 1.2 cm. in size and similar in character to the left. No ejaculatory ducts, no calculus. A small bit of mucous membrane has been removed with the median lobe.

Microscopic examination.—A section from the hemorrhagic area in the right lateral lobe presents a very interesting picture. There is a great increase in the fibrous tissue with some increase in the muscle fibers, and a comparatively small number of acini. The great majority of the acini are small and apparently compressed, and in areas there is almost complete destruction of the acini. In sections from other portions, about many of the acini there is a rather dense layer of connective tissue forming almost a thickened basement membrane, and outside this tissue of apparently recent formation the interstitial fibrous hyperplasia is quite marked, often assuming a concentric arrangement about the acini. There are a few small areas of round celled infiltration and an occasional leucocyte. The epithelium lining the tubules, in many areas almost fills the lumen. In a few dilated acini, which are present in the section, the epithelium is distinctly flattened. There is considerable general increase in the smooth muscle, in some areas myomatous tissue being rather abundant, while in other areas the fibrous tissue predominates.

The section is that of fibro-myomatous hypertrophy with partial atrophy of the adenomatous tissue.

CASE 59.—*Slight enlargement of median and lateral lobules. Contracted bladder; frequent urination. Cure. Followed 19 months.*

No 756. A. W., age 65, single, admitted October 15, 1904.

Complaint.—"Frequency of urination."

Had gonorrhœa at the age of 25 and again 10 years later.

Present illness began four years ago with difficulty of urination. During the next year difficulty and frequency increased and three years ago he had complete retention and had to be catheterized. Since then has required catheterization several times. Has suffered no pain, and has not lost weight.

S. P.—Urination about every two hours, and often very difficult. Occasionally very great frequency. No incontinence, no pain.

Sexual powers.—Erections are still present, has not had intercourse for two years.

Examination.—The patient is a sturdy looking man, lips of good color, slight arteriosclerosis, pulse of good volume. A systolic murmur is present at apex. Abdomen, negative.

Genitalia.—The right testicle is undescended but is palpable in the inguinal canal.

Rectal.—A large excoriated pile is present. The prostate is moderately enlarged, bulges considerably into the rectum, the median furrow is shallow and the notch is absent. It is smooth, elastic, but firm. There are no nodules, no induration and the seminal vesicles are negative.

Cystoscopic.—Coudè catheter passes with ease and finds 30 cc. residual urine. The bladder capacity is 150 cc. It is very irritable, and after being filled several times it will retain only 100 cc. The cystoscope shows a small rounded median lobe with a fairly deep sulcus on either side; lateral lobes are not intravesically hypertrophied. The bladder is considerably trabeculated; there is no stone present. With finger in rectum and cystoscope in urethra the beak cannot be felt and the thickness of the median portion is considerably increased.

Urinalysis.—Slightly cloudy, acid, sp. gr. 1015, no albumin, no sugar. Urea G-17 in 24 hours. Microscopically, pus cells and colon bacilli.

October 20, 1904.—The patient returns two days after cystoscopy. Urination has been every half hour except when he has used a catheter, after which he has relief for two hours.

October 22, 1904.—Urination still difficult and frequent. Catheter finds only a few drops of residual urine, and bladder capacity is very small.

Operation, October 25, 1904.—Ether. Perineal prostatectomy by the usual technique. Enucleation of slightly enlarged lateral lobes, and a small median lobe.

The lateral lobes were only moderately hypertrophied. The median lobe measured 3 x 2 x 2 cm. in size and was easily removed through one of the lateral cavities. The ejacuatory ducts were preserved.

The wound was closed as usual. Double drainage tubes in the bladder and light packs for the lateral cavities. The patient stood the operation well, the pulse at the end being 80. Continuous irrigation and infusion on return to the ward.

Convalescence.—The patient convalesced well, the highest temperature being 99.8° on the day after the operation, after which it was practically normal. The tubes and gauze were removed on the second day, and the patient was up before the end of a week. On November 3, a note was made that the patient's condition was excellent, wound healthy, and urine coming partly through the anterior urethra. He had had no rise in temperature, which was normal, and his pulse since the operation had ranged between 70 and 85. He slept seven hours at a time and enjoyed his meals.

November 7, 1904.—Two days ago the patient began to vomit. Before this his bowels had not moved for several days. The pulse has been good, varying from 80 to 96 and the patient has voided urine in good amount through the urethra. Urine contains no albumin, no casts, sp. gr. 1022.

He was infused, put on nutritive enemata and active hydrotherapy. The nausea and vomiting still persist.

November 9, 1904.—The patient has ceased vomiting and he is more comfortable.

November 18, 1904.—The convalescence was considerably retarded by the attack of nausea and vomiting. Perineal fistula has closed. The patient voids urine in a good stream at intervals of two to four hours and in large amounts. His cardiac murmur is much more pronounced since attack of nausea. Patient discharged 24th day.

May 1, 1905.—(Five months after operation.) Urination is normal; the stream large; interval five hours. Sexual desire and partial erections have returned. Urine is clear and contains no pus.

November 30, 1905.—I void urine naturally twice during the day and twice during the night. The wound is closed, I have no pain and am cured. I have erections, but have not attempted intercourse.

May 8, 1906.—Patient comes for examination. He says that he voids urine naturally and with ease. Does not have to arise during the night. He suffers no pain. He has erections occasionally. General health excellent and he considers himself entirely cured. The patient voided about 150 cc. urine, clear and microscopically negative. Rectal examination negative. Silver catheter passes with ease, and shows no residual urine, no stricture.

Pathological report.—The specimen, G. U. 109, consists of the three lobes of the prostate and weighs G-13. The right lobe weighs 2.5 x 1.5 x 1 cm. and weighs G-3. The left lobe measures 3 x 1.5 x 1 cm. and weighs G-7. The middle lobe 2 x 2 x 1 cm. and weighs G-3. The surfaces are irregularly lobulated, and the sections show numerous spheroids, and dilated acini. Towards the periphery there is considerable fibrous tissue.

Microscopic examination.—In the left lobe the hypertrophy is a moderately glandular one with considerable dilatation and occasional cystic degeneration of the acini. In the right and middle lobes the hypertrophy tends distinctly towards the fibro-muscular form, the stroma being somewhat in excess. There are however areas which present the usual picture of a glandular hypertrophy. The stroma throughout the whole gland is comparatively dense, and contains much more connective tissue than muscle. The stroma in the portions where the acini are numerous shows considerable new connective tissue formation. Some areas of chronic interstitial and glandular prostatitis are present.

CASE 60.—*Small round median lobe. Moderate lateral lobes. Complete retention. Cure. Followed eighteen months.*

No. 772. F. A. G., age 71, married, admitted October 1, 1904.

Complaint.—"Enlarged prostate."

Had gonorrhœa in his youth. No complications.

Present illness began 18 months ago with slight frequency of urination which gradually increased until recently the patient was urinating five times during the night. The stream was small, lacked force, but

there was never any pain nor dribbling. There was no hesitation, but often considerable precipitancy. About 10 days ago retention of urine became complete and since then the patient has been unable to void and has required catheterization daily. His sexual powers have been absent for five years.

Examination.—The patient is a well-nourished man with lips of good color. Chest and abdomen are negative.

Rectal.—The prostate is moderately enlarged, smooth and fairly soft. The seminal vesicles are negative. Urine is acid and contains pus cells and bacilli, and there is no evidence of renal insufficiency.

Operation, October 28, 1904.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were of moderate size and neither the mucous membrane of the urethra nor the bladder was torn in their removal. The median lobe was then drawn with the tractor into the left lateral cavity where it was enucleated with some difficulty owing to close adhesions, but the mucous membrane covering it was not torn. This lobe was globular and measured 1½ cm. in diameter. The finger was then inserted into the bladder through the urethra and no prostatic enlargement detected. The wound was closed as usual with double drainage tubes and light packs for the lateral cavities. Infusion and continuous irrigation on return to room. The condition of the patient was excellent at the end of the operation.

Convalescence.—The patient reacted well. The gauze was removed on the second day and the tubes on the third. The patient was out of bed on the eighth day and the fistula closed within two weeks. There were no complications except considerable bronchitis and slight fever for 10 days. He left the hospital on the 31st day.

January 10, 1905.—The patient says he feels better now than he has for years. Only gets up once at night to urinate and can retain urine six or eight hours in the day. He voids with a good stream without hesitation and has no incontinence. A catheter passes without meeting obstruction and finds no residual urine present. The bladder capacity is 400 cc. The urine is purulent and contains bacilli.

September 22, 1905.—The patient has been laid up with epididymitis on the right side. Urination is normal.

December 22, 1905.—The right testicle has again become swollen and the patient has suffered considerable pain. Urine is voided in a large stream three or four times during the day and only once at night. The wound is healed and the patient suffers no pain. Erections which were absent before operation have not returned. The urine still contains pus and bacilli.

May 9, 1906.—I void urine naturally, three or four times during the day and often not at all during the night, about eight ounces at a time without pain. Erections which were absent for several years have not returned. My general health is excellent and I consider myself cured.

Pathological report.—The specimen, G. U. 114, consists of the three lobes of the prostate each removed in one piece and weighs 28 gm. The

right lobe weighs 10 gm., and measures 4 x 2 x 1.5 cm. It is soft, elastic, fairly smooth, and on section shows spheroids with numerous dilated ducts, and a moderate amount of stroma. The left lobe weighs 10 gm., measures 3.5 x 2 x 1.5 cm., and is similar in appearance to the right, but shows more cystic dilatation, and in places greenish secretion suggesting pus. The median lobe weighs 8 gm., and shows more fibrous tissue than the lateral lobes. No mucous membrane, no ejaculatory ducts, no calculi.

Microscopic examination.—The hypertrophy in the right and left lobes is of the glandular type with dilatation of the ducts and in places quite a marked cystic degeneration. The stroma is comparatively small in amount and contains more fibrous than muscle tissue. There is considerable interstitial and glandular prostatitis.

The median lobe contains adenomatous areas in which the acini are dilated, but the stroma is far in excess. It is a fibro-muscular type of hypertrophy with the fibrous element predominating, and some points of round celled and polynuclear infiltration.

CASE 61.—*Moderate hypertrophy of median and lateral lobes. Acute cystitis and epididymitis preceding operation. Cure. Followed 18 months.*

No. 831. C. W. P., age 50, married, admitted November 11, 1904.

Complaint.—"Frequency of urination and burning."

Gonorrhœa 25 and 23 years ago with apparently no symptoms of posterior involvement.

Present illness began eight years ago with difficulty in starting urination. The patient consulted a physician who passed sounds, but found no stricture and diagnosed enlargement of the prostate. From that time until now his condition has grown gradually worse. On November 5 he had complete retention of urine for the first time and since then has been catheterized six times on this account. Since then both testicles have become swollen and very painful.

S. P.—Urination about every hour during the day and 10 times at night. Very little pain, no hemorrhage. General health excellent.

Sexual powers.—No note made.

Examination.—Patient is a well-nourished man with lips of good color. The chest and abdomen are negative.

Genitalia.—Both epididymes are slightly swollen, indurated and very tender, the result of recent epididymitis.

Rectal.—The prostate is moderately enlarged, smooth, elastic. The seminal vesicles are negative.

Cystoscopic.—Owing to the presence of epididymitis cystoscopy was not performed. A large silver catheter passes with ease and finds 120 cc. residual urine. The bladder is irritable, acutely inflamed, and catheterization is painful. Owing to the epididymitis it was thought advisable to postpone the operation, but the frequent and dfficult urination and pain on catheterization rendered immediate operation advisable.

Urinalysis.—Urine cloudy, acid, 1015, no sugar, albumin a trace. Large amount of pus and mucus present.

Operation, November 12, 1904.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were easily enucleated and were only moderately enlarged. The median portion came away in two pieces, one a small median bar, and the other an intravesical lobule which was removed through the left lateral cavity. The ejaculatory ducts were preserved intact and only a small tear was made in the urethra along its left lateral wall. The wound was closed as usual with double tube drainage for the bladder, and light packs for the lateral cavities. The patient stood the operation well. Pulse at the end 100. Infusion and irrigation on return to the ward.

Convalescence.—The patient reacted well, but had a chill on the day after the operation and a rise of temperature to 104.5°. After that the temperature ranged between 99° and 101° until the seventh day when it rose to 102°, and was associated with an increase in the inflammation in the epididymes. After that the left epididymis returned to normal, but the right went on to suppuration and on December 15, 33 days after the operation, the abscess was opened through two incisions. After that the patient rapidly improved and was discharged six days later in excellent condition. The gauze and tubes were removed at the end of 24 hours. The urine was very slow in passing through the urethra, and the perineal fistula was still open on his discharge from the hospital on the 39th day. He was voiding urine, however, at intervals of three or four hours, had no pain in the bladder, and the right epididymis was markedly improved.

May 8, 1906.—Letter. I void urine naturally about five times in 24 hours, sometimes not at all during the night. The amount voided at one time is about 10 ounces. I suffer no pain, erections have returned and I have satisfactory intercourse. My general health is good, I have gained 10 pounds in weight, and I consider mysef cured.

Pathological report.—Specimen, G. U. 118. The prostate has been removed in four pieces, and weighs 14 gm. The right, left and median portions of the prostate are about equal in size, measuring each about 2.5 x 2 x 1.5 cm. A small irregular intravesical median lobe has been removed in one piece and measures 1.5 x 1 x 1 cm. The surface of the lobes is irregular and somewhat torn, rather soft in consistence, and on section presents no spheroids.

Microscopic examination.—The hypertrophy is of the distinctly glandular type and arranged in lobules. There is present quite a marked glandular and interstitial prostatitis, and the lumina of the acini are in many areas filled with degenerated epithelial cells and leucocytes. The stroma is largely composed of fibrous tissue and there has been formed considerable new inflammatory tissue interlacing in different directions. The arteries show no thickening.

CASE 62.—*Moderate hypertrophy of median and lateral lobes. Two vesical calculi. Cure. Followed 18 months.*

No. 786. E. S., age 68, single, admitted November 5, 1904.

Complaint.—"Painful and frequent urination."

Patient had gonorrhœa in his youth.

Present illness began three years ago with sudden retention of urine after drinking beer. After this he had to be catheterized for several months. Since then he has not required the catheter, but micturition has been very frequent and painful.

S. P.—The patient urinates every half hour night and day. Micturition is accompanied by a severe pain which radiates to the end of the penis.

Sexual powers.—Patient has erections, but has not had intercourse for several years. His general health is bad and he has lost about 60 pounds in weight in the past five months.

Examination.—The patient is rather slender, and his lips are pale. Chest and abdomen are negative.

Genitalia.—Marked thickening of both epididymes. No evidence of hernia. Arteries somewhat sclerotic, but pulse regular and full.

Rectal.—The prostate is moderately hypertrophied, the left lobe being the more prominent. The median furrow and notch are obliterated, and the contour is rounded, smooth and elastic. The seminal vesicles are not palpable.

Urinalysis.—Cloudy, acid, sp. gr. 1025, no sugar, a trace of albumin, much pus, but no casts.

Cystoscopic examination.—A catheter passes with ease and finds 140 cc. residual urine (at other times from 350 to 440 cc. residual were found). The bladder is very irritable, and the tonicity good. The cystoscope shows two fairly large calculi in the base of the bladder, dark brown in color and with irregular surfaces. The bladder is considerably inflamed and trabeculated, but no diverticula are seen. The intravesical portion of the prostate is only slightly enlarged, but irregular in shape. The left lateral lobe is only slightly hypertrophied, the right is more prominent, and connecting the two is an irregular median bar of moderate degree. With finger in rectum and cystoscope in urethra it is impossible to feel the beak of the instrument, and there is apparently considerable increase in the median portion of the prostate.

Preliminary treatment.—Urotropin, lithia water. Under this treatment the patient improved considerably.

Operation, November 12, 1904.—Ether. Perineal prostatectomy by the usual technique. Extraction of calculi through the perineum. The lateral lobes were moderately enlarged and easily enucleated. It was impossible to engage the middle lobe with the tractor which was then withdrawn and the finger inserted. The median lobe was then easily pushed into the left lateral cavity where it was enucleated and proved to be about 2 cm. in diameter. The left lateral wall of the urethra was

torn, and the remainder was divided with the scissors and the neck of the bladder dilated before the insertion of stone forceps. The two calculi were easily extracted, measuring 2 x 2½ x 3 cm. and 1 x 2 x 2½ cm. The urethra was not sutured and the wound was closed as usual with double tube drainage for the bladder and light gauze packs for the lateral cavities. A submammary infusion was started on the table and a continuous irrigation after the patient's return to the ward. The patient stood the operation well, his pulse at the end being 80.

Convalescence.—The patient reacted well. The temperature reached 101.2° on the second day and was practically normal after the third day. The tubes and gauze were removed on the second day, the irrigation having continued for 48 hours. The patient was walking within a week. Urine came through the penis on the seventh day, and the fistula closed on the 12th day. He was discharged from the hospital on the 18th day.

December 1, 1904.—(19th day). The patient voids urine at intervals of two hours. He has good control, but there is slight dribbling at the end of urination. The stream is large and he suffers no pain. A catheter passes with ease and finds 10 cc. residual urine. The bladder capacity is 250 cc.

February 28, 1905.—The patient has gained 23 pounds since operation. Retains urine for five hours during the day and arises twice during the night. A catheter enters with ease and there is no stricture present and no residual urine. The bladder capacity is 300 cc. The cystoscope shows a slightly irregular prostatic margin with a small almost pedunculated redundant fold of mucous membrane in the anterior portion of the left lateral lobe. With finger in rectum and cystoscope in urethra the median portion of the prostate is about normal in size.

November 30, 1905.—Letter. I void urine as well as I ever could, once during the night, a little more frequently during the day and about half a pint at a time. I suffer no pain, the wound is healed, and I am cured. I have had no erections. In August, 1905, the right testicle became swollen. My general health is good and I have gained 45 pounds.

May 8, 1906.—Letter. I void urine naturally, once during the night and six times during the day, about half a pint at a time. I suffer no pain. I have imperfect erections, but have not attempted intercourse. My general health is good and I consider myself cured.

Pathological report.—The specimen, G. U. 119, consists of seven lobules, weighing in all 38 gm. The left lateral lobe is the larger and has been removed in two pieces. The median lobe measured about 2.5 cm. in diameter. The character of the prostatic lobes is about the same, irregularly lobulated, and the cut surface is fairly firm with two dilated ducts and little demarcation into spheroids. Two stones are also preserved, the larger measuring 3 x 2.5 x 2 cm.

Microscopic examination.—The hypertrophy is a distinctly glandular one with a tendency to arrangement of the gland tissue in lobules. The acini

are for the most part slightly dilated, and are often closely set with but slender bands of stroma interlacing between them. Areas are seen where there is marked intraacinous proliferation in the shape of slender pedicles of connective tissue, occasionally containing some few muscle fibers, lined by epithelium similar to the epithelium lining the acini. The stroma in places contains some young connective tissue even in areas where there is no prostatitis present. The stroma altogether contains much more connective tissue than muscle. Some areas of chronic prostatitis are present.

The middle lobe is distinctly more fibrous than the lateral lobes, and there is present quite a marked prostatitis with partial atrophy in many areas of the gland tissue. Very few corpora amylacea are seen.

Case 63.—*Considerable enlargement of median and lateral lobes. Several previous suprapubic operations for calculus and hemorrhages. Perineal prostatectomy. Natural urination established. Suprapubic fistula failed to close. Operation. Excision of suprapubic scar tissue and fistula. Excision of median portion of prostate. Still in hospital.*

No. 1326. C. R. P., age 75, widowed, admitted October 11, 1904.

Complaint.—Bleeding from the bladder, and suprapubic fistula.

The patient had gonorrhœa in 1875 with no complication.

Present illness began 16 years ago with frequent urination, and during the next two years he had frequent attacks of gravel, often a dozen in quick succession. He had no pain or hematuria until 1891 when he passed blood for three days and urination was very frequent and difficult. He then catheterized himself and drew off two pints of bloody urine. After that he catheterized himself at various times, sometimes for complete retention of urine, at others to relieve a distended bladder. In August, 1897, he had considerable hemorrhage and catheterization was difficult on account of clots. He then entered the Johns Hopkins Hospital. At that time he was catheterizing himself every two hours and was unable to void naturally. He was treated in the hospital for five weeks by catheterization and vesical irrigation. Examination showed a very large prostate, and a searcher detected calculi in the bladder.

Operation, October 16, 1897.—Ether. Suprapubic cystotomy by Dr. Halsted. Two large stones were removed, and a large intravesical and prostatic hypertrophy discovered. A hard rubber drainage tube was sutured into the bladder.

Convalescence.—The patient remained in the hospital for a month. His suprapubic sinus had contracted down, and he was able to wear a Bloodgood suprapubic drainage apparatus with comfort.

April 21, 1899.—The patient returns, complaining of leaking around the tube. His general health is excellent with the exception of a chronic bronchitis.

May 15, 1904.—The patient returns, complaining of hemorrhage from the bladder. He has worn the Bloodgood bag since 1897. During the last two years there have been six attacks of hemorrhage from the bladder,

each lasting a day or two but not accompanied by pain. Last night the bladder became distended with blood and could not be emptied either through the suprapubic sinus or through a catheter.

Operation, May 17, 1904.—Ether. Dr. Finney. Suprapubic cystotomy for hemorrhage from bladder. The bladder was exposed, and two large tortuous veins discovered in the mucous membrane covering the middle lobe, from which there was considerable oozing of blood. These points were seared with a Paquelin cautery and the bladder packed with iodoform gauze.

Convalescence.—The patient stood the operation well and convalesced nicely. He remained in the hospital for 28 days and left in good condition, wearing a Bloodgood bag.

October 11, 1904.—The patient returns complaining of severe hemorrhage from the bladder which has been present for several days. He is in good condition, his lips are of good color, and his heart is negative but for a slight systolic murmur. Lungs are clear. There is a large suprapubic fistula in which he wears a tube connecting with a Bloodgood bag. The bladder contains blood clots, but there is a leakage of bloody urine from the suprapubic opening.

Rectal.—The prostate is considerably enlarged, smooth, elastic, with no areas of induration, no nodules.

Preliminary treatment.—The bladder was irrigated with a solution containing adrenalin. At first these were followed by considerable hemorrhage, but after several days the hemorrhage ceased. The patient has worn the Bloodgood tube and bag for several years with comparative comfort, but at times there has been a leakage and some pain. On account of the recurrences of severe hemorrhage the patient was advised to have the prostate removed through the perineum.

Operation, October 20, 1904.—Young. Ether. Perineal prostatectomy by the usual technique. The right lobe was about 7 x 5 x 4 cm. in size and easily enucleated. The left lobe was somewhat smaller. A median lobe 4 cm. in diameter was delivered through the right lateral cavity without tearing the urethra or the bladder. Examination with a finger in the suprapubic wound showed a small median bar which had not been removed. It was not considered sufficiently large to warrant a continuance of the operation because there was rather more hemorrhage than usual. The perineal wound was closed with a catheter and gauze drain, and another catheter was placed in the suprapubic wound. Patient stood the operation well. Pulse at the end was 75. Continuous irrigation on return to the ward.

Convalescence.—The patient reacted well. The temperature did not rise above 100° and after two days was normal. The gauze was removed on the second day and the tubes on the third without bleeding. There were considerable nausea and vomiting for three days, and the patient was given an infusion, and after that the convalescence was uninterrupted. The perineal fistula closed on the 17th day, and the suprapubic sinus was then excised partially to hasten its closure. Following this slight operation

there was a temperature for three days reaching as high as 101.5°, associated with slight nausea and vomiting. No further rise in temperature. On December 2, as the suprapubic sinus still persisted, a retained catheter was placed in the urethra, but after 18 days the suprapubic fistula was still patent, and the catheter was withdrawn. The patient was discharged from the hospital December 23, 64 days after the operation. He was voiding urine through the urethra and had no incontinence, but there was still a slight leakage through the suprapubic wound.

May 8, 1906.—The suprapubic fistula has not healed. The patient voids urine naturally through the urethra, but if more than two hours elapse urine escapes through the suprapubic fistula. He catheterizes himself occasionally and finds about three ounces of residual urine. He has no pain, no hematuria, has not passed a calculus, and his general health is excellent.

Examination.—The patient looks well. There is a pin-point suprapubic fistula surrounded by considerable scar tissue. A coudè catheter passes with ease and finds about 100 cc. residual urine. Bladder capacity is 180 cc.

Rectal.—In the median line, high up, a globular prostatic enlargement about 2 cm. in diameter is felt. It is smooth and soft, and there is no induration in the region of the vesicles. The cystoscope shows a small rounded median lobe.

Operation, May 9, 1906.—Ether. Excision of scar tissue around the suprapubic fistula. The fistula was quite necrotic and was surrounded by a considerable mass of scar tissue. Examination of the bladder showed a transverse septum behind the ureteral orifices and two septa running from it to the prostatic orifice, one on each side. Within these septa and behind the prostatic orifice was quite a deep pouch, apparently about 4 cm. in diameter. There was a definite enlargement of the median lobe in the shape of two small globular masses with a sulcus between. These were enucleated with the assistance of a finger in the rectum in three pieces without removing any mucous membrane. The prostate orifice, which was already enlarged, was considerably enlarged by this procedure. There was a moderate amount of hemorrhage which was controlled by gauze packing. The suprapubic wound was partially closed with interrupted silver wire. Patient stood the operation well. Infusion on the table. Pulse at the end was good.

Convalescence.—The patient reacted well. The temperature rose to 101° on the second day, but after that it was normal. At the end of 20 days the suprapubic fistula showed no sign of closing, and a retention catheter was placed in the urethra and allowed to remain for a week. After its removal the patient began to void at intervals, but the suprapubic fistula still leaks slightly, now 37 days after the operation. The condition of the patient is excellent, and the suprapubic fistula shows every evidence of healing soon.

Pathological report.—The specimen, G. U. 1008, consists of the three

lobes of the prostate and weighs 25 gm. The right lobe has been removed in one piece, measures 5 x 4.5 x 3 cm., and weighs 11 gm. The surface is lobulated, there is little capsule, and on section there is considerable gland tissue, a moderate amount of stroma, and very few dilated acini. The left lobe measures 5 x 3.5 x 2 cm., weighs 8 gm., and on section contains more fibrous stroma than the right. The middle lobe consists of several pieces, measuring in all 4 x 3.5 x 2 cm., and weighing 6 gm. The cut surface is quite smooth, lobulation is not marked, and condensation at the periphery is very plain. No mucous membrane, no ejaculatory ducts, no calculi.

Microscopic examination.—The hypertrophy is a distinctly glandular one. There is moderate dilatation of the acini which are lined for the most part by two layers of epithelium. The acini show the usual picture of gland proliferation. The stroma is comparatively small in amount, and it is mostly composed of connective tissue, there being very little muscle present. There is some young connective tissue in the stroma. Some areas of chronic prostatitis.

CASE 64.—*Moderate hypertrophy of both lateral lobes. No median lobe. Catheter life. Cure. Followed 18 months.*

No. 780. H. W. S., age 56, widowed, admitted November 18, 1904.

Complaint.—"Enlarged prostate—frequent urination."

No history of gonorrhœa.

Present illness began about five years ago with frequency of urination. This gradually increased until nine months ago he was voiding urine five or six times at night, felt badly, had a constant nausea, and muscular pains over the body. In September, 1904 (two months ago), an examination showed that his abdomen was distended and a catheter withdrew a quart of residual urine. Since then the patient has been catheterized twice daily, and for a time his symptoms improved. During the past two weeks he has had chills and fever, but has had no pain. He has lost 40 pounds in weight and is very weak.

S. P.—Retention of urine is complete. He is catheterized twice daily and from 600 to 800 cc. urine withdrawn each time. His sexual powers are still good.

Examination.—The patient is fairly well nourished, his lips are pale. The chest and abdomen are negative.

Rectal examination.—The prostate is considerably enlarged, particularly the left lateral lobe. The general contour is rounded, smooth and elastic. The seminal vesicles are not palpable.

Urinalysis.—Cloudy, sp. gr. 1015, reaction acid, no sugar, trace of albumin. Microscopically, some pus cells, no casts.

Preliminary treatment.—The patient was given urotropin, water in abundance, catheterized at first twice a day, from 600 to 800 residual urine being obtained, and later three times a day. The total quantity of urine varied from 2000 to 2700 cc. daily. Urea from 8 to 16 gr. daily. Patient is free from nausea and his condition seems sufficiently good for operation.

Cystoscopic examination.—The cystoscope shows considerable intravesical enlargement of both the lateral lobes with a cleft between them in front and behind. In the median portion of the prostate is a transverse fold of mucous membrane which is hardly large enough to be called a bar. The ureters are easily seen and appear normal, as shown in the accompanying chart, Fig. 44. In series D, No. 1, the small fold behind the enlarged lateral lobe is seen. On elevating the cystoscope the lateral lobes disappear from view, and the median fold is alone seen, Fig. 4. These charts are interesting as showing how without taking successive views it would be possible for the operator to be mistaken as to the size of the median fold which assumes large proportions when the handle of the cystoscope is

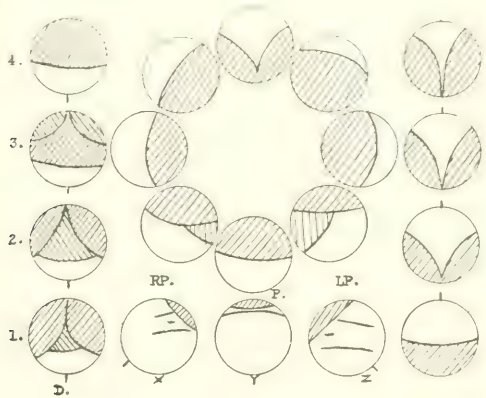


FIG. 44.—Case 64.

elevated and the prism of the instrument is in close contact with the fold, thus giving a greatly magnified view. Figs. X, Y and Z, however, show that the ureters and interureteral ligament are easily seen.

Operation, November 25, 1904.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes which were quite large were removed each in one piece. Examination of the median portion of the prostate, after enucleation of the lateral lobes, showed no hypertrophied mass, but what seemed to be only a pronounced vesical sphincter. No definite median bar or lobe. The median portion was therefore not removed. The urethra and bladder were not torn. The wound was closed as usual with double tube drainage for the bladder and light packing for the cavities. There was very little hemorrhage. Infusion was given on the table. His pulse at operation was 100°. Continuous intravesical irrigation was instituted on return to the ward.

Convalescence.—The patient reacted well. The temperature arose to 101° after the operation but was normal after the second day. The irrigation was continued for two days when the gauze and tubes were removed and

the patient was allowed to be up in a chair. Urine passed through the penis on the sixth day, and the fistula closed on the 10th day. Incontinence ceased on the eighth day and interval urination rapidly increased. The patient was discharged on the 16th day when the following note was made: Urine is voided in a large stream without hesitation about every four hours during the day. Last night he did not urinate from 11 p. m. to 6 a. m. There is no incontinence. A catheter passes easily, no obstruction is present, and 110 cc. urine is withdrawn. The bladder capacity is 300 cc. and the tonicity good. He has had no complications and no instrumentation since operation.

November 30, 1905.—Letter. I void urine naturally, three or four times during the day and twice at night, in large amounts as I drink a great deal of water. I suffer no pain. The wound is closed, and I consider myself cured. I have erections and sexual intercourse is satisfactory. My general health is perfect.

May 8, 1906.—Letter. My condition is the same as in my last letter. I void urine naturally, just as well as ever. I have no pain. Erections have returned, and sexual intercourse is somewhat imperfect.

Pathological report.—The specimen, G. U. 120, consists of the lateral lobes of the prostate each of which has been removed in one piece and weighs in all G-24. The right lobe weighs G-12, and measures 4 x 3 x 2 cm. The surface is smooth, and on section numerous spheroids with intervening stroma and a small number of dilated acini are seen. The left lobe weighs G-12, and measures 4 x 2.5 x 2.5 cm. The outer surface is more lobulated. Section shows numerous large and small spheroids, considerable stroma, and no dilated acini. No mucous membrane nor ejaculatory ducts have been removed, no seed calculi.

Microscopic examination.—The hypertrophy consists of very glandular areas alternating with rather broad bands of stroma containing but a few acini, most of which are small and flattened. Within the glandular lob ules the acini are rather small, and the interlacing frame work is composed of slender bands containing more fibrous tissue than muscle. The stroma in the extra-lobular portions is rather dense, and contains slightly more connective tissue than muscle, the relative amount varying in different parts. There are areas of well marked interstitial and glandular prostatitis with numerous leucocytes in the dilated ducts.

Case 65.—*Considerable enlargement of lateral and median lobes. Patient reacted well, and progressed well for three weeks. Death from pneumonia 24th day.*

No. 1333. C. B., age 87 years, married, admitted December 3, 1904.

Complaint.—Pain and difficulty of urination.

Admits having had gonorrhœa.

Present illness began two years ago with difficulty in urination. A little later the patient began to suffer pain and urination became very frequent. For some time he has been using a catheter, but is able to void urine

in small amounts. Hematuria has occasionally been present. He now rises 10 to 12 times at night to urinate.

Examination.—The patient is poorly nourished, but his lips are of good color. The radial and brachial arteries are markedly sclerosed. The lungs are negative.

Heart.—There is a marked pulsation over the left chest, the point of maximum impulse being in the fifth interspace 11 cm. from the median line. The heart is enlarged to the left, and at the apex both sounds are



FIG. 45.—Large lateral lobes, each with a portion of median lobe attached; patient aged 87.

much accentuated, but no murmurs are heard. Sounds at the base are also clear. The abdomen is negative. Hydrocele is present on the right side. The penis is covered with blood and the urine which escapes into a bottle contains clots of blood.

Rectal.—The prostate is considerably enlarged, smooth and elastic. Median furrow and notch not present. Seminal vesicles negative. Urine—alkaline, 1011, a trace of albumin; microscopically, pus cells, granular casts, and bacteria. Urea G. 1.3 to liter. Total amount of urine, 1800 cc.

Cystoscopic.—The patient voided about 50 cc. urine. A small coudè catheter passes with ease and finds only 30 cc. residual urine. Bladder

capacity is 150 cc. and considerable difficulty is experienced in obtaining a clear fluid. Hemorrhage occurred and cystoscopy is therefore unsatisfactory. Considerable intravesical prostatic enlargement of the median and lateral lobes was made out, however. With finger in rectum and cystoscope in urethra the beak could not be felt and the prostate appeared to be very large.

Operation, December 7, 1904.—Ether. Perineal prostatectomy by the usual technique. Both lateral lobes were enucleated with ease and were about equal in size, measuring 3 x 4 x 5 cm. The median portion of the prostate was moderately enlarged and easily removed through the lateral cavities, Fig. 45. An anterior intravesical lobe was found and also enucleated, a tear being made in the bladder on the left side in its removal. The patient was infused on the table and stood the operation well. The wound was closed as usual with double tube drainage, and light gauze packs for the lateral cavities.

The patient stood the operation well. The pulse did not go above 90 and at the end was 70, respirations 24.

Convalescence.—The patient reacted well, the pulse being 80 during the next four hours. During the night the pulse was 120, and the patient complained of pain, but he was able to drink water in large amount and the next morning his pulse was 80, and the temperature normal. For 20 days after the operation the temperature was practically normal, only once reaching 100.6°. His pulse varied from 80 to 100. The tubes were removed on the day after the operation and the gauze on the next day. There had been very little hemorrhage and the condition of the patient was excellent. After that the patient was fairly comfortable, he was soon out of bed and walking about the ward. The urine continued to come through the perineum, but his condition was greatly improved. On December 27, his pulse was 80, his temperature 98°, and he was up and about. He still complained of pain due to the irritation of alkaline urine on the wound, but his condition was very satisfactory. On December 28, three weeks after the operation his temperature arose to 100°, on the next day to 101° and on the next to 102°. Examination of the chest showed a severe bronchitis associated with rapid difficult breathing and a cough. Examination of the lungs showed loud moist râles and loud breath sounds. After three days his condition became worse, a definite pneumonia was present, the temperature rose to 103°, the pulse to 140, and the patient died at 4 p. m., January 1, 1905. No autopsy was allowed.

Remark.—The patient reacted well considering his age, and at the end of the third week was walking about, fairly strong and comfortable. About this time there was a sudden change in the weather and a severe cold spell set in. The patient then developed pneumonia and died in five days. The operator also had pneumonia and did not see him during his last illness.

Pathological report.—Specimen, G. U. 121, consists of the three lobes of the prostate removed in five pieces, and weighs in all G-101. The right

lobe has been removed in two large pieces, weighs G-64, and measures in all 7 x 5 x 3.5 cm. The surface is irregularly lobulated and considerably torn, and on section the tissue is found to be composed of many large and small spheroids with marked cystic dilatation and very little stroma. The left lobe has been removed in two pieces and is similar in character to the right. The part said to be the middle lobe weighs only G-2, and measures 2 x 2 x .8 cm. in size. It is flat and on section shows very little glandular tissue.

Microscopic examination.—The hypertrophy in the lateral lobes is of a distinctly glandular type with areas of quite extensive cystic degeneration. The epithelium lining the acini usually consists of two layers, although here and there considerable intraacinous proliferation of the epithelium growing out into the lumen in solid cell masses is present. The stroma contains an unusually large amount of muscle, but for the most part the connective tissue element predominates. There is considerable interstitial round celled infiltration.

A section from the middle lobe shows a fibro-muscular tissue which contains no glandular acini. The tissue contains a large amount of muscle, but the fibrous element probably predominates. There is present some round celled infiltration especially marked in areas, and the arteries show quite well advanced arteriosclerotic changes.

Case 66.—*Moderate enlargement of median and lateral lobes. Vesical calculus. Two previous suprapubic operations for calculus. Perineal prostatectomy and lithotomy. Cure. Followed two and one-half years.*

S. N. 15,927. J. D., age 54, married, admitted November 30, 1904.

Complaint.—" Frequency of urination and pain."

No note as to gonorrhœa.

17 years ago the patient was run over by a cart, the pelvis and neck of the bladder were ruptured, and extravasation of urine resulted. He was laid up for nine months, but after that he was well for four years, when stricture developed. He received treatment by dilatations and was apparently relieved. In 1900, the patient was admitted to the hospital and suprapubic cystotomy performed for vesical calculus. He remained well for three years.

About January 1, 1904, urination became difficult and painful at the end, this continued for three months when he entered the hospital the second time, and suprapubic cystotomy for calculus was again performed. A calculus about 5 cm. in diameter was removed. The patient reacted well. Urine did not pass through the urethra until the 31st day, and the patient was discharged on the 48th day.

For two months after leaving the hospital the patient was very well. He then began to have frequency of urination, difficulty, and pain which has continued up to the present time.

Status præsens.—Urination difficult, very frequent and painful. The pain is felt at the neck of the bladder and is worse at the end of urination, occasionally slight pain in the legs. His general health is excellent.

Sexual powers.—No note made.

Examination.—The patient is well nourished with lips of good color. The heart and lungs are negative and there is only slight arteriosclerosis.

Rectal.—The prostate is considerably enlarged, smooth and soft. The seminal vesicles cannot be reached. On the left side the prostate is adherent to the pelvis, but no enlarged glands are to be felt.

Cystoscopic.—Catheter passed with ease and found 200 cc. residual urine. The bladder is contracted and will not admit more than 200 cc. of fluid. The cystoscope shows a large round stone in the base of the bladder. There is considerable enlargement of the lateral lobes, but owing to the presence of stone, the size of the middle lobe cannot be made out. With the finger in rectum and cystoscope in urethra there is considerable increase in the median portion of the prostate.

Urine.—Cloudy, 1002, acid, no sugar, no albumin. Microscopically, pus cells and epithelial cells.

Operation, December 10, 1904.—Ether. Perineal prostatectomy by the usual technique. Removal of a large vesical calculus. The lateral lobes which were of considerable size were very adherent to the capsule and urethra, and were removed with difficulty in several pieces. The median lobe was only slightly enlarged, but was removed through the left lateral cavity. The urethra was opened on the left lateral wall and a large calculus removed in several pieces. Finger introduced into the bladder showed a small diverticulum about 5 cm. in diameter with its orifice just behind the trigone. The wound was closed as usual with double tube and iodoform gauze drainage. The patient stood the operation well, the pulse at the end being 100.

Convalescence.—The patient reacted well. His temperature did not rise above 101° and was normal after the fourth day. The gauze and tubes were removed on the fourth day, but urine did not pass through the anterior urethra until the 15th day. The perineal fistula closed on the 27th day, and the patient was in excellent condition, but remained in the hospital. On the 35th day there was a chill and rise of temperature to 104°. The patient had a slight cough. The wound was almost healed and looked well. The patient continued to have a little fever, and on the 47th day the perineal fistula opened again. Sounds passed easily into the bladder and no stone was found. After that he improved and was discharged on February 9, 1905, the 61st day. The perineal fistula had closed finally on the 58th day. He was able to retain urine for three hours, was able to void urine without pain or discomfort and his condition was excellent.

May 17, 1906.—Letter. The perineal wound has remained closed, I void urine naturally four or five times during the day and twice at night, about half a pint at a time. I suffer no pain. Sexual intercourse is satisfactory. I have had no complications or subsequent treatment. My general health is better than ever since the operation. I have gained in weight, and I consider myself almost cured.

Pathological report.—The specimen, G. U. 123, consists of three prostatic

lobes (right, left, and median), and fragments of a vesical calculus. The right lobe weighs G-5, and measures 2 x 2 x 1 cm. in size. On section spheroids of different sizes are seen with small cysts, three of which contain calculi about the size of a grape seed. In other places very small seed calculi are seen. The left lobe weighs G-4, measures 2.5 x 1 x 1 cm., is more fibrous than the right, and contains one grape seed calculus. The middle lobe weighs G-2, and measures 2 x 1 x .6 cm., is very fibrous and contains no calculi. The vesical calculus consists of a mass of sand and soft stone with a small round hard nucleus 1.5 x 1 x .6 cm. in size.

Microscopic examination.—The acini are not arranged in lobules, but are disseminated throughout the stroma. There is present a very marked prostatitis with abundant endoglandular proliferation and degeneration of epithelial cells, with round and polynuclear infiltration of the interstitial tissue. Many of the arteries show quite extensive thickening. The middle lobe is a moderately glandular one. The acini are dilated and show marked papillomatous-like proliferation. The epithelium lining the acini and the papillomatous projections is often many layers thick, the lumina sometimes being filled with epithelium and a few leucocytes. There is some round celled and polynuclear infiltration of the stroma. The stroma in all three lobes contains considerably more fibrous tissue than muscle.

Case 67.—*Moderate enlargement of median and lateral lobes. Chronic uremia, nausea, headache. Chronic nephritis. Angina pectoris. Cured. Followed 16 months.*

No. 1053. W. K., age 70, married, admitted November 23, 1904.

Complaint.—"Frequency and burning on urination."

No history of gonorrhœa.

Present illness began two years ago with burning on urination. Several months later he began to have considerable frequency of urination particularly at night, and was constantly nauseated. During the last few months he has had greater difficulty in urination, his health has been bad and he has suffered considerably with stomachic disturbance and more or less constant nausea. For several weeks he has been under treatment by Dr. Likes, who has catheterized him several times daily. Under this treatment he has improved in health, but still feels weak. The patient has not had complete retention. After voiding a small amount of urine the flow is suddenly stopped by a severe pain. He has had no hemorrhage. Incontinence is frequently present at night.

Sexual powers.—For two months the patient has had no sexual desire or ability to have intercourse.

Examination.—The patient is well developed, lips pale and his skin is of poor color. The chest is barrel shape, but the lungs are apparently negative. The heart sounds are negative. (The patient, however, has had several attacks of angina pectoris.) The abdomen is negative with the exception of a distended bladder.

Rectal.—The prostate is only slightly enlarged, smooth, firm, no nodules. The seminal vesicles are not palpable.

Urinalysis.—Acid, 1002, albumin in small amount, no sugar, microscopically negative.

Urea.—G-5, in 24 hours.

Cystoscopic.—Catheter passes with ease and finds 500 cc. residual urine. The cystoscope shows a small median lobe, but only slight enlargement of the lateral lobes. The bladder is trabeculated, but only slightly inflamed.

Preliminary treatment.—The patient was sent to the hospital and catheterized regularly three times a day for a week. He was able to void from 300 to 700 cc. daily, but the catheter removed generally from 500 to 700 cc. residual urine each time. The total quantity voided varied from 1200 to 1900 cc. daily. The patient was then discharged and was treated at home by catheterization three times a day. Under this treatment the patient improved steadily, nausea disappeared, his appetite returned, and the sp. gr. of the urine gradually increased until it finally reached 1015. The quantity voided diminished and the urea increased from about 5 G. daily to about 15. After six weeks his condition was sufficiently good to warrant an operation.

Operation, January 9, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were only slightly enlarged and were easily removed. A small median lobe was removed through one of the lateral cavities. The ejaculatory ducts were preserved. The wound was closed as usual with double tube drainage, and light packs for the lateral cavities. The patient stood the operation well, pulse at the end being 100. An infusion was given on the table and continuous irrigation on return to ward.

Convalescence.—The patient reacted well. On the day after the operation the temperature arose to 100°, but fell to normal the following day and remained practically normal afterward. The gauze and tubes were removed on the third day. The patient was up in a wheel chair on the sixth day. The perineal fistula closed completely on the 16th day. Epididymitis developed on the 21st day, and caused considerable pain. An attack of gout, from which the patient had long been a sufferer, showed itself with severe pain in the toe and knee. Convalescence was therefore delayed, but the patient was discharged on the 26th day, in excellent condition, the wound completely closed, voiding urine naturally through the urethra without incontinence.

November 30, 1905.—Letter. The wound has remained healed. I have used no catheter, void urine naturally about every two hours during the day and three or four times at night. I have occasionally sexual desire, but no erections. My general health is fairly good. At times I suffer pain in the right testicle.

April 21, 1906.—I void urine naturally three or four times during the day and often do not get up at night. The stream is large; I have no pain, no hesitation. I have had erections and intercourse once since operation. My general health is excellent and I consider myself cured.

Urine clear, 1014, faint trace of albumin, no sugar, few pus cells, few epithelial cells, no cast found on careful search.

Pathological report.—The specimen, G. U. 125, consists of the two lateral lobes of the prostate each removed in two pieces and weighing in all G-34. The right lobe weighs G-13, one piece measures 3.5 x 2 x 1.3 cm. and the other 2.5 x 2.5 x 1 cm. The surfaces are lobulated; the cut surface is fairly firm, and does not show many spheroids or many dilated acini. The left lobe weighs G-21, and the two pieces measure 3.5 x 3 x 2 cm. and 3.5 x 2.5 x 2 cm. Their surfaces are lobulated, encapsulated, and the cut surface shows much more spheroid formation and dilated acini.

Microscopic examination.—The hypertrophy is a distinctly glandular one with arrangement in lobules. Within the lobules the acini are often close-set, and small, and the epithelium usually two layers in thickness, the superficial layer being cylindrical and the basement cells having a cuboidal shape. Again the acini are dilated and numerous intraacinous projections are seen. Some cystic degeneration with flattening of the epithelium is present in areas. In the interlobular tissue the stroma is more abundant, and the acini are at times small and occasionally much depressed. The stroma in the glandular lobules shows considerable new connective tissue formation. Some few areas of prostatitis are present.

Case 68.—*Moderate enlargement of lateral lobes. Small median bar. Cure.*

No. 792. E. L. C., age 71, widowed, admitted December 10, 1904.

Complaint.—" Difficulty of urination. Catheterism once daily, and pain."

The patient has never had gonorrhœa.

Present illness began about 15 years ago with a slight difficulty in urination. 10 years ago he had complete retention of urine and required catheterization once. After that there was a gradual increase in the difficulty and frequency of urination, and one year ago patient was arising three times at night to urinate. In June, 1904, the second retention of urine came on, a catheter being passed and one and one-half pints of urine being removed. Since then he has used the catheter three or four times during the night, but during the day he voids naturally, but with pain and at intervals of an hour. The pain comes on before and during urination and is referred to the end of the penis. He has never had any hematuria, nor renal colic. He has had epididymitis once. Erections have been absent for five years. He now voids every hour during the day and uses the catheter three times at night. He suffers pain when the bladder becomes full, but this is relieved by catheterization. No pain in other locations.

Examination.—The patient is a thin, rather weak-looking man with pale mucous membranes. Chest is barrel shaped, expansion poor and breath sounds feeble. The heart is slightly enlarged but otherwise negative.

The prostate is moderately hypertrophied, forming a mass about the size of a medium sized lemon with the long diameter along the urethra, the median furrow and notch being obliterated. The lateral lobes are equally enlarged, smooth, elastic, and not tender. The seminal vesicles

are not palpable, and no glands are to be felt. The globus major of the right epididymis is indurated and enlarged, and the left epididymis is also indurated, but not enlarged.

Cystoscopic.—A coudè catheter passes with ease and withdraws 400 cc. of residual urine. The bladder capacity is apparently large and the tonicity good. The cystoscope shows a moderate enlargement of both lateral lobes and median bar confluent with the right lateral lobe but separated from the left by a shallow sulcus. The bladder is markedly trabeculated and inflamed, and numerous pouches and one small diverticulum are present at the vertex of the bladder. The ureters could not be definitely located. In the base of the bladder, just behind the median portion of the prostate, an irregular dark mass is seen. It is partially covered with mucus and it is therefore difficult to say exactly what it is, though it is probably a blood clot. With the finger in the rectum and cystoscope in the urethra there is apparently no thickening in the region of the trigone and the median portion of the prostate is only moderately enlarged.

Perineal prostatectomy was advised and the patient returned February 7 for operation, improved in health.

Second cystoscopic examination showed that the black mass had disappeared and there was nothing to suggest a neoplasm. The bladder capacity was 550 cc. Residual urine 250 cc. Urine was cloudy and contained pus and bacilli. Slight cloud of albumin, no sugar. Urea G-10 the liter.

Operation, February 8, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were found to be moderately enlarged and were easily enucleated, leaving the urethra and ejaculatory ducts intact. The median bar was enucleated through one of the lateral cavities and was of moderate size. The wound was closed as usual with gauze for the lateral cavities and double tube drainage for the bladder. Submammary infusion of salt solution was given at the end of the operation and continuous irrigation for the bladder was started on the return to the ward. There was very little hemorrhage and the patient stood the operation well.

Convalescence.—The patient reacted well after the operation. The gauze was removed on the day after the operation and the tubes on the third day, continuous irrigation having been maintained only 15 hours after the operation. The patient was out of bed on the fourth day, but was slow in walking. The urine ceased to come through the perineal fistula on the 28th day. Highest temperature after the operation was 100.7°, and temperature was normal after the 10th day. The patient was discharged on the 28th day. On March 11, the following note was made: The patient can hold his urine for four hours, urination is free and the stream is large. He has no incontinence, but if he changes his position quickly a few drops may escape. He is free from pain and feels well. The wound is healed with the exception of a small granulating point. The urine contains albumin and a few granular casts.

May 12, 1905.—The patient can hold his urine from five to seven hours. Goes to bed at 10 o'clock and does not arise until five to urinate. Micturition normal.

June 24, 1905.—Micturition normal, and at intervals of from four to seven hours. He has no incontinence, but if he coughs or sneezes sometimes a few drops escape. A catheter passes with ease and finds only 38 cc. residual urine. Bladder capacity about 450 cc. The wound is tightly healed and his general condition is excellent.

The urine contains only a slight trace of albumin.

November 30, 1905.—Letter. The wound has remained closed. I void urine naturally, three or four times during the day and once at night. (After an interval of seven hours.) I have voided as much as one pint at a time. I have no pain. No erections. My general health is good and I have gained 10 pounds.

May 8, 1906.—Letter. I void at intervals of five hours during the day and seven or eight hours at night. Urination is normal, I have no pain, no erections. Occasionally I have a slight discharge of blood in the urine, but in every other particular I am perfectly well and consider myself cured.

Pathological report.—The specimen G. U. 128, consists of the two lateral lobes of the prostate each in one piece and weighing in all G-31. The right lobe weighs G-17, and measures 4.5 x 3 x 2.5 cm. The surface is irregularly lobulated, and on section there are the usual spheroids and dilated ducts of adenomatous hypertrophy. There are no areas of induration, no calculi, and nothing suggesting malignancy. The left lobe weighs G-14, and measures 4 x 3 x 2 cm., and is similar in character to the right.

Microscopic examination.—The hypertrophy is a distinctly glandular one. The acini are some small, some dilated, and in some areas show cystic degeneration. At the periphery of the glandular lobules the tissue is condensed, largely composed of connective tissue, and the acini are flattened and elongated. The stroma for the most part is quite small in amount, and contains a great deal of young connective tissue. There is present very little muscle. Some areas of mild chronic prostatitis.

Case 69.—*Considerable hypertrophy of median and lateral lobes. Renal infection, fever, suprapubic cystotomy previously. Granular casts. Cure. Followed 15 months.*

No. 835. J. M., age 70, married, admitted February 13, 1905.

Complaint.—" Prostatic hypertrophy. Suprapubic fistula."

The patient never had gonorrhœa.

Present illness began about 10 years ago with frequency of urination. This gradually increased until July, 1897, when complete retention of urine came on and he had to be catheterized for several days. At periods varying from a week to several months he would have attacks of retention of urine and would have to be catheterized for a time. About five weeks ago a catheter had to be used, and after being catheterized three or four times a day for a period of two weeks he became very ill

with high fever and pain in the region of the left kidney. Diagnosis of pyelitis was made and suprapubic cystotomy for drainage performed by his physician. Since then urine has escaped through the suprapubic wound and the patient has improved steadily.

Sexual powers.—Erections and sexual powers normal up to recent illness.

Examination.—The patient is a very feeble old man, his lips are pale, and the lungs are hyperresonant but otherwise normal. The heart is dilated and the sounds are feeble.

Abdomen.—There is no special tenderness, no enlargement in the region of the kidneys. A small suprapubic sinus is present in which a drainage tube is fastened; all of the urine escapes through the suprapubic tube. The right epididymis is indurated and tender as the result of epididymitis three weeks ago.

Rectal examination.—The prostate is considerably enlarged, symmetrical, smooth and elastic. The urine is cloudy, acid, contains a large quantity of albumin, no sugar. Microscopically, pus and a moderate number of granular casts. Urea grams 13 to the liter, total quantity of urine 1.8 liters daily. Sp. gr. 1010.

Preliminary treatment.—The patient was given large amounts of water to drink and urotropin for two days. Cystoscopic examination was not made as his physician reports that there was no stone present and that both lateral and median lobes were present.

Operation, February 15, 1905.—Perineal prostatectomy by the usual technique. Two very large lateral lobes and a small median lobe were enucleated. The lateral lobes were found to extend very high into the bladder and crowded in front of the urethra. The deeper portion of the left lateral lobe was pedunculated, but was removed with ease without tearing the mucous membrane covering it. The median portion of the prostate was removed partly with the right lateral lobe and partly with the left, leaving an opening of communication between the two lateral cavities behind the urethra and in front of the ejaculatory bridge which was not torn. The wound was closed as usual with double catheter drainage for the bladder and light packs for the lateral cavities. The suprapubic fistula was curetted and a soft rubber catheter fastened in the suprapubic opening. The patient was infused on the table. His pulse at the end of the operation was 90, and his condition excellent.

Convalescence.—The patient reacted from the operation well and had no fever. The gauze was removed in 48 hours, and the patient sat up in a chair. On the third day the tubes were removed. On the sixth day there was a sudden rise of temperature to 103° at 2 p. m., and general malaise. The physical examination was negative. The treatment was active hydrotherapy, hot applications, saline infusion beneath the breast of 600 cc., salt solution per rectum, and potassium acetate and citrate. On the next day the temperature was normal. On the eighth day part of the urine came through the penis and the patient was up and walked about. On the 16th day the suprapubic wound closed and on the 17th the perineal fistula closed.

March 10, 1905.—The patient is discharged (23d day). He has been taking long walks for several days. His general condition is excellent, both wounds are closed, and he voids urine naturally at intervals of four hours, in a large stream without hesitation or incontinence.

November 30, 1905.—Letter. I void urine naturally, five times during the day and twice at night, about 10 ounces at a time and without pain. No instrument has been passed since the operation and I have had no complication. I consider myself cured. I have had no erections.

May 8, 1906.—Letter. I void urine naturally, about eight times during the day and three times at night, sometimes as much as nine ounces at a time. I suffer a slight pain when my bladder becomes inflamed. I have not had erections. My general health is good.

Pathological report.—The specimen, G. U. 129, consists of the median and the two lateral lobes of the prostate, each removed in one piece and weighing in all G-62. The left measures 5 x 3.8 x 2.5 cm. and weighs G-24, is in the form of a smooth oval mass and shows on section the typical spheroid with intervening stroma, dilated glands and peripheral condensation. The right measures 4.5 x 3 x 3 cm. and is similar to the left. The middle measures 3 x 3 x 4 cm. in size, and weighs G-17, and is similar in appearance to the lateral lobes. No mucous membrane or ejaculatory ducts have been removed. The consistence is everywhere elastic.

Microscopic examination.—The hypertrophy is of a lobulated glandular type, the gland tissue being much in excess of the stroma. The acini are some about normal in size, others are dilated, and again in some, cystic degeneration is present. The stroma contains a fair amount of muscle, which is less in amount than the connective tissue. The vessels are apparently normal, a few corpora amylacea are seen.

Case 70.—*Moderate enlargement of median and lateral lobes of prostate. Previous suprapubic cystotomy. Perineal prostatectomy. Removal of two vesical calculi. Recurrence of calculus. Litholopaxy unsuccessful. Perineal lithotomy. Cure. Followed nine months.*

No. 730. W. C. V., age 62, married, admitted September 27, 1904.

Compaint.—"Enlarged prostate and suprapubic fistula."

No history of gonorrhœa.

Present illness began 20 years ago with frequency of urination. This gave patient very little trouble until four years ago, since when he has had considerable difficulty and frequency of urination, and at times very great pain with inability to void urine until he has waited half an hour. Two years ago he had an attack of suppression of urine, the catheter finding no urine in the bladder. Two months later suprapubic cystotomy was done to relieve pain and frequency of urination. During the past two years the patient has worn a suprapubic drainage tube and no urine has come through the urethra. During the past two months he has had several attacks characterized by severe pain beneath the ribs and in the back on both sides. He has had gravel in the urine for over a year and constantly a dull pain in the region of the bladder and occasionally hematuria.

Sexual powers.—No note made.

Examination.—The patient is a well nourished man with lips of good color. Chest negative. In the hypogastric region is a sinus in which the patient is wearing a tube which leads into the bladder.

Rectal.—The prostate is considerably enlarged, soft, smooth, and not tender. Upper limits difficult to reach. The bladder capacity is 325 cc. when filled through the suprapubic wound. The urine is cloudy, acid, 1020, no sugar, no albumin. Pus cells present, but no casts. Urea 12 gm. to the liter.

Preliminary treatment.—The patient promised to return for operation, and in the meantime he was told to drink water in abundance and to take urotropin. He returned February 14, 1905, when his condition was about the same with the exception that he was passing considerable gravel and his urine was very irritating. He was able to pass small amounts through the urethra.

Operation, February 18, 1905.—Ether. Perineal prostatectomy by the usual technique. Two moderately enlarged lateral lobes were easily enucleated and a large median lobe was drawn down by the tractor into the left lateral cavity and enucleated, a small area of vesical mucosa coming away attached to it. Examination with the finger showed no remaining enlargement of the prostate. With stone forceps two small irregular soft calculous incrustations were removed. After careful search no other calculi were found. The bladder is markedly trabeculated and there are numerous pouches. Patient stood the operation well, pulse at the end being 105. The wound was closed with a single perineal drainage tube, the lateral cavities being packed with gauze.

Convalescence.—The patient reacted well. The temperature rose to 100.6° on the day after the operation, but was normal again in two days. The gauze and tubes were removed in 48 hours. He was nauseated and refused nourishment several times and was infused in order to avert uremia. During the second week the patient began to complain severely of a pain, frequent micturition and vesical spasm. These symptoms persisted and on March 24 cystoscopic examination was performed. A catheter passed with ease, found 40 cc. residual urine, and bladder capacity of 250 cc. The cystoscope showed a rough white calculus lying on the trigone just back of the prostatic orifice. The suprapubic wound closed, the patient was voiding urine at intervals of two hours, but the perineal fistula was still open.

Operation II, March 30, 1905.—Attempt at litholapaxy. The stone was felt in passing into the bladder, but no stone could be caught with the forceps. The operation was therefore given up. Shortly afterward the patient had a chill and temperature of 101.5°, nausea and vomiting.

April 9, 1905.—During the past 10 days the patient has been in a weak, stupid condition. At times he has had hiccoughs, nausea and vomiting. His temperature has been as high as 103.5°, and there has been a daily rise to two or three degrees above normal every day. He has been infused several times, but his condition is not good.

April 11, 1905.—Operation III.—Ether. Enlargement of perineal fistula. Extraction of small rough calculus from dilated prostatic urethra. The stone was found lying just in front of the vesical orifice in a much dilated, pouch-like, prostatic urethra. It was easily extracted and examination of the bladder showed no other calculi. A drainage tube was inserted. An infusion was given on return to ward. Pulse during the operation was bad, being 135 at the end.

Convalescence.—The patient reacted well and began to improve at once. The temperature, after two days, was normal, and the patient was soon out of bed. On the sixth day after the operation a slight phlebitis of the left leg began, but disappeared in a week. The perineal fistula healed on the 20th day, and patient was discharged from the hospital on May 1, 1905. His condition excellent.

November 30, 1905.—Letter. The wound has remained healed. I void urine naturally about every two hours night and day, but I void almost a pint at a time, sometimes. I have no pain, but occasionally a slight uneasiness. I have erections (slight) and occasionally sexual intercourse. The erectal powers seem greatly diminished. I have gained in weight and my general health is good.

Pathological report.—The specimen, G. U. 131, consists of the median and lateral lobes of the prostate which have been removed in four pieces and weighs in all 50 gm. The right lobe weighs 11 gm., and measures 4 x 3.5 x 1.5 cm. It is composed of one large and one small piece, and presents on section small and large spheroids with some dilated acini. The left lobe weighs 17 gm., and measures 5.5 x 3.5 x 2 cm. and presents the picture similar to the right. The middle lobe is larger than either of the other two, weighs 22 gm., and measures 6 x 4 x 1.5 cm. The ejaculatory ducts and the urethral and vesical mucosa have not been removed.

Microscopic examination.—In this tissue there is present a mixed type of hypertrophy, portions being rich in gland tissue with arrangement in lobules, while other portions contain a considerable excess of stroma. In the glandular areas the acini show the usual pictures, some dilatation, occasional cystic degeneration, and complexity of the lumina of the acini. One sees marked intraacinous proliferation, and numerous solid cell cones projecting into the lumina. In the portions rich in stroma the acini are for the most part irregular in outline, some dilated and others compressed with here and there evidence of glandular proliferation. The stroma is largely composed of fibrous tissue, although occasionally one notes portions where the muscle is fairly abundant.

Case 71.—*Moderate enlargement of median and lateral lobes. 500 cc. residual urine. Previously two Bottini operations and a perineal prostatectomy in Germany. Cure. Peculiar burning in posterior urethra.*

No. 846. D. G., age 60, single, admitted February 17, 1905.

Complaint.—"Cannot empty bladder."

Gonorrhœa several times during his youth.

Present illness began about five years ago with frequency of urination. One year later he consulted a surgeon in Germany who performed the Bottini operation. No improvement followed this, and his sexual powers were destroyed. One month later another Bottini was performed, also without success. After this his frequency increased, and he had poor control, and three years ago the same surgeon performed perineal prostatectomy. Following this he was somewhat improved, voided less frequently and was fairly comfortable until two months ago by which time urination had become quite frequent, often every half hour during the day and about three times at night. He was catheterized by Dr. Likes who found 250 cc. residual urine, and since then he has been catheterizing himself once or twice every day.

S. P.—The patient uses a catheter at night and does not have to void again until morning when the catheter is used again. During the afternoon he voids at intervals of from 15 minutes to one hour. His general health is good. He has had no erections since the first Bottini operation.

Examination.—The patient is a sturdy-looking man, lips of good color. Chest and abdomen negative. In the perineum is a long scar commencing in the middle line just back of the scrotum, and thence extending backward to within 2 cm. of the anus, from which point it curves around the left side of the anus to a point near the tip of the cocyx.

Rectal.—The prostate is distinctly palpable. The right lobe is slightly larger than normal, the surface being rounded, fairly prominent and soft in consistence. The left lobe is smaller than normal and quite hard.

Cystoscopic.—Coudé catheter passes with ease and finds 500 cc. residual urine. The bladder capacity is large, tonicity good. Cystoscope shows a small rounded median lobe with a fairly deep sulcus on each side. The lateral lobes are not intravesically hypertrophied. The bladder is considerably trabeculated and slightly inflamed. There is no stone present. With finger in rectum and cystoscope in urethra the median portion did not feel much greater than normal (cystoscope in one of the sulci).

Urinalysis.—Urine cloudy, acid, 1015, slight amount of albumin, no sugar. Microscopically, pus cells and bacilli.

Operation, February 20, 1905.—Ether. Perineal prostatectomy by the usual technique. Considerable scar tissue was encountered, rectum was very adherent and a small tear was made in separating it from the prostate. The usual bilateral capsular incisions were used and a fairly large right lateral lobe was easily enucleated. From the left side only a small mass of cicatricial tissue was excised. The median lobe was removed in part with the tissue from the left lateral, and in part separately from the mucous membrane covering it. A finger then showed a considerable tear in the left lateral wall of the urethra, but no remaining prostatic tissue at the neck of the bladder. The rectum was then closed with interrupted sutures of fine silk, two layers covered in by a layer of catgut sutures. The levators were also drawn together with catgut. Double catheter drainage and light packs for the lateral cavities and the usual closure. The patient stood the operation well. His pulse at the end was 100. Infusion and continuous irrigation on return to ward.

Convalescence.—The patient reacted well, but complained of pain. The tubes and gauze were removed on the second day. He was kept on milk diet for a week, the bowels being confined by a lead and opium pill. At the end of that time his abdomen was distended and he was very uncomfortable. Evacuation was obtained by castor oil by mouth, and oil enema followed later by soap-suds enema. After that he was put on light diet and his bowels moved again frequently. The rectal wound healed per primam, but the urine did not come through the anterior urethra until the 18th day, and the patient complained of a severe burning in the region of the wound. The perineal fistula healed on the 25th day, and he was discharged from the hospital on the 33d day, voiding urine at intervals of two or three hours and very comfortable.

April 14, 1905.—The patient urinates in a large stream at intervals of about two hours, has perfect control, and no dribbling of any sort. A catheter passes with ease and finds 25 cc. residual urine. The bladder capacity is 275 cc. on forced distention. The urine is acid and is moderately purulent.

November 11, 1905.—Patient urinates two or three times during the night.

January 17, 1906.—The patient voids urine satisfactorily, but complains of a burning sensation in the urethra which becomes worse when the bladder becomes full and causes him to urinate. He arises twice at night and voids at intervals of three hours during the day. Kollmann dilator is passed, shows no stricture and is dilated up to 35.

January 23, 1906.—The patient was improved for a few days after dilatation, but the burning in the urethra persists. A simple lanolin ointment is deposited in the urethra.

February 10, 1906.—The patient still complains of a burning in the deep urethra which is more or less constantly present, disappearing for a while after urination. He only rises twice at night to urinate, and in the day time is able to retain urine for three hours, but towards the later part of the interval the burning becomes very uncomfortable. Urine is voided in a large free stream without hesitation or difficulty. A silver catheter passes with ease, meets no obstruction and finds 25 cc. residual urine, and a bladder capacity of 500 cc.

April 7, 1906.—Various medicines have been tried without affording relief to burning in the urethra. The patient is otherwise perfectly cured.

May 8, 1906.—The patient comes for examination. He says he voids urine well at intervals of about three hours. There is no obstruction to urination, and his only complaint is a peculiar burning sensation in the posterior urethra which increases as the bladder becomes full of urine, rendering urination imperative. He has no severe pain, no hemorrhage, and the wound has remained closed. A catheter passes with ease and finds 15 cc. residual urine and a bladder capacity of 400 cc. Erections have not been present since the first Bottini operation. The urine is very slightly cloudy and not very markedly acid.

Rectal examination is negative; no prostatic enlargement present.

Pathological report.—The specimen, G. U. 133, consists of four pieces of prostate and weighs about 18 gm., forming a mass which measures in all 4.5 x 4 x 2.5 cm. The regions from which the masses came have not been noted, but the appearance is everywhere the same—small spheroids and little masses of gland tissue separated by considerable masses of stroma. No mucous membrane has been removed. The ejaculatory ducts are not present, no calculus.

Microscopic examination.—Microscopically the tissue from the right and left lobes shows distinctly more stroma than gland tissue. One occasionally sees a fair number of acini aggregated and surrounded by a dense stroma in which the ducts are very much flattened. One sees in the different areas the picture of a moderately glandular hypertrophy, and also pictures of the fibro-muscular type. The stroma is compact and contains a large amount of fibrous tissue, the muscle element being comparatively small. In the middle lobe there is much more gland tissue present than in either of the lateral lobes, but even here the stroma predominates, and it contains a fair amount of muscle. There are quite numerous areas of chronic prostatitis.

This hypertrophy would seem to be of a mixed type, the fibro-muscular type predominating.

Case 72.—*Very great hypertrophy of median and lateral lobes of prostate. Cure.*

No. 847. J. G., age 59, married, admitted February 18, 1905.

Complaint.—" Prostatic hypertrophy. Catheterism."

There is no history of gonorrhœa.

Present illness began about eight years ago with slight difficulty in urination. After several weeks the patient had retention of urine which required catheterization. During the next three years urination became gradually more difficult, and five years ago second retention occurred, and he was catheterized a second time before micturition was again established. After that the patient catheterized himself on account of retention at various times, but the catheter was not used regularly every day until five months ago, since which time he has used the catheter twice daily. He has very little pain, and his general health has been good. For the last two weeks his bladder has been irritable and painful, and he has had a dull pain beneath the ribs on the left side.

S. P.—He now uses the catheter three or four times a day and can void only small amounts of urine. The catheter passes with ease, and there is no hemorrhage, and no pain except in the bladder.

Sexual powers.—The patient has erections, but has not attempted intercourse for eight months.

Examination.—The patient is well nourished, with lips of good color. Heart, lungs and abdomen are negative. There is no hernia present.

Rectal examination.—The prostate is of great size, the transverse diameter being about four inches, the longitudinal less, but difficult to estimate as the finger cannot pass the upper end. The prostate bulges far towards

the rectum, it is elastic, but firmer than normal, smooth, and there are no nodules or areas of induration present. No enlarged glands are felt and the prostate is not tender. An attempt was made to catheterize the patient, but an impassable obstruction was met 11 inches from the meatus. Hemorrhage was produced, and cystoscopic examination was therefore not attempted.

Urinalysis.—Cloudy, acid, sp. gr. 1020, albumin a slight trace, sugar none, urea 11 grams to the liter. Microscopically, pus and bacteria.

Preliminary treatment.—The patient remained in the hospital 10 days before operation. Owing to difficulty of catheterization a retained catheter was employed. On February 22 the patient developed a marked pleurisy on the left side, but his temperature did not go over 100°, and after a few days the pain disappeared and the chest was clear.

Operation, February 28, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes proved to be very large and were easily enucleated without tearing the urethra. The median lobe was immense and in removing it through the right lateral cavity a tear was made in the urethra, but no mucous membrane was removed and the bladder was uninjured. The entire tissue removed weighed 145 grams. The wound was closed as usual with double catheter drainage and light gauze packs for the lateral cavities. The patient was infused on the table and continuous vesical irrigation was provided on return to the ward. The patient stood the operation well. His pulse at the end was 80.

Convalescence.—The highest temperature after the operation was on the second day, 99.8°. All drainage was removed in 48 hours. For one week there was incontinence of urine, and after that the patient was able to void at intervals of two hours at first. Urine began to flow through the penis on the 13th day, and the perineal fistula closed on the 18th day.

March 23, 1905.—Last night the patient slept five hours without urinating. He voids urine in a large stream and without hesitation, and has no incontinence, except that when the desire to urinate comes on a few drops may escape before he can void. He suffers very little pain. A catheter passes with ease, and no residual urine is present. The bladder holds 320 cc. Urine is acid, sp. gr. 1015, and there is a small amount of albumin, some pus cells and bacilli.

March 25, 1905.—The patient is discharged to-day. His condition is excellent.

April 3, 1905.—Letter. At times I can hold my urine for four hours, but when I become fatigued I have difficulty in retaining it.

November 30, 1905.—Letter. I void urine naturally, three times during the day and not at all during the night, about a pint at a time. The wound is closed, and I consider myself cured. I have had no erections. My general health is excellent.

May 9, 1906.—Letter. I void two or three times during the day and once at night, and nearly a pint at a time. I have erections at night, but have not attempted intercourse. My general health is excellent. I have gained 20 pounds in weight and consider myself cured.

Pathological report.—The specimen, G. U. 135, consists of prostate removed in seven pieces and weighs 145 gm. The median lobe measures about 7 x 4 x 3 cm. The intravesical portion of the right lateral lobe measures 7 x 5 x 4 cm. The other masses are smaller, varying from 3 to 5 cm. in diameter. No mucous membrane has been removed with the intravesical portions of the prostate, but portions of the lateral walls of the urethra have been removed along with the lateral lobes. The floor of the urethra and the ejaculatory ducts have not been removed. The lobes contain numerous spheroidal masses of various sizes more or less firmly bound together by fibrous stroma. The consistence is elastic. There are no areas of induration and no suggestion of malignancy.

Microscopic examination.—The hypertrophy is a moderately glandular one, there being present a considerable amount of stroma. The acini are some small, others dilated, and some few show cystic degeneration and flattening of the epithelium which consists for the most part of a single layer of cells. One sees in the same section areas rather rich in gland tissue, and areas in which there is a marked hyperplasia of the connective tissue with only vestiges here and there of acini. The stroma is rather dense. There are numerous areas of chronic prostatitis with periacinous and interstitial inflammatory tissue formation. The stroma contains more connective tissue than muscle, although in places muscle fibers are fairly plentiful. The blood vessels seem practically normal.

Case 73.—*Considerable right lateral, small median and left lateral lobes. Recent complete retention. Residuum 80 cc. Cure. Sudden death after return home—heart failure.*

No. 852. J. L. G., age 67, married, admitted February 25, 1905.

Complaint.—"Difficulty in urination."

The patient has never had gonorrhœa.

Present illness began 15 years ago with a slight difficulty and frequency of urination. Since then he has been subject to similar attacks which have gradually gotten worse. He suffers slight irritation, but never any pain. Three weeks ago complete retention of urine came on, and his physician produced considerable hemorrhage in attempting to introduce a soft rubber catheter. A large silver prostatic catheter entered with ease and withdrew a pint of urine. He was catheterized for two days, but after that voided with little difficulty. At present he arises three times at night to void and has considerable difficulty in urinating. He suffers very little, but he is afraid to leave his physician and his business requires that he take long trips. He therefore wishes to be cured. His sexual powers have been absent for three years.

Examination.—The patient is a well nourished man, with lips of good color. Thorax: Expansion is fair and equal. Vocal fremitus present throughout, lungs are clear on auscultation and percussion. The heart sounds are best heard 9 cm. from the mid-line in the fifth interspace, and

are clear. The heart is negative. The pulse is regular. The abdomen is negative. There is a right sided inguinal hernia for which the patient wears a truss.

Rectal examination.—Slight hemorrhoids are present. The prostate is moderately but distinctly enlarged, particularly in the right lateral lobe, which is more prominent, wider and longer than normal. The consistence is soft, contour rounded, and there is no induration. The left lateral lobe is only slightly enlarged, and soft. The seminal vesicles are not indurated.

Cystoscopic examination.—A coudé catheter passes after meeting an obstruction in the median portion of the prostate and finds 80 cc. residual urine. The bladder capacity is 300 cc. and the tonicity good. The cystoscope shows a small median bar and considerable intravesical enlargement of the right lateral lobe and a small left lateral lobe. The bladder was moderately trabeculated, but not inflamed. With the finger in the rectum and cystoscope in the urethra there was considerable thickness noted in the median portion of the prostate.

Urinalysis.—Acid, sp. gr. 1016, no albumin, no sugar. Microscopically, a few leucocytes. Urea 17 grams to the liter. The secretion obtained by prostatic massage is composed of spermatozoa, a few hyaline and granular cells; no pus cell.

Operation, February 28, 1905.—Ether. Perineal prostatectomy by the usual technique. The left lateral lobe was small, the median bar was only moderately large and was removed through one of the lateral cavities. The right lateral lobe was considerably enlarged and projected well into the bladder. It was easily enucleated without tearing the mucous membrane covering it. A slight linear tear was made in the urethra, but the floor and ejaculatory ducts were preserved intact. The wound was closed as usual with light gauze packs for the lateral cavities, but no tube drainage was supplied for the bladder. The amount of hemorrhage was slight, and the patient stood the operation well. An infusion was given before return to the ward.

Convalescence.—On the day following the operation the temperature arose to 100.6°, but 36 hours later it was normal. The gauze packs were removed on the morning following the operation, and the patient was out of bed the next day. Forty-three hours after the operation the patient passed nearly all of his urine through his penis, and after the second day very little urine came through the perineum, and on the sixth day the fistula closed finally. Immediately after the operation the patient voided urine at intervals, at first every hour, on the seventh day every two hours, on the 14th day every three hours, and on the 21st day every five to six hours. For the first two weeks there was considerable urgency when the desire to urinate came on, but never any incontinence.

March 21, 1905.—The patient is discharged to-day (21st day). For the past week the patient has been walking about the hospital grounds. His strength normal, general condition excellent, and urination about every four hours without pain and with perfect control. His urine contains a few pus cells, but no bacteria.

March 25, 1905.—Letter. I feel perfectly well. Void urine at intervals of from five to six hours without difficulty or incontinence.

March 29, 1905.—The patient died suddenly in his bed at 6 o'clock this morning. His physician, Dr. E. K. Root, writes as follows: After our patient's return, he felt perfectly well, passed urine easily without pain or dribbling, rose only once during the night and said he felt better than he had for two years. Examination showed a blood pressure of 180 mm., and I cautioned him against doing much work. On March 26 he complained of pain in his stomach and vomiting. There was no increase in pulse rate. I prescribed calomel, milk diet and vichy. On the evening of the 28th he felt so much better that he was up and about his room, saw some personal friends and demanded more to eat, and said he would get downtown the next day. Urination was entirely normal. At 6 a. m., March 29, friends failed to arouse him, and sent for me. He was pulseless, gasping for breath, and only lived five minutes. As the heart had always been unusually competent, my opinion was, in view of the arterial tension, that there was a sudden cerebral hemorrhage, probably basilar, that killed him.

Pathological report.—The specimen, G. U. 134, consists of the three lobes of the prostate, each removed in one piece, and a sub-urethral nodule, total weight being 31 gm. The median lobe is the largest and measures 4 x 3 x 2 cm. The lateral lobes are about equal in size and measure 3 x 2 x 1.5 cm. A globular sub-urethral lobule about 1 cm. in diameter is present. The tissue removed is everywhere similar in character, lobulated and composed of gland tissue with a moderate amount of cystic dilatation, and fair amount of stroma. No mucous membrane, no ejaculatory ducts, no calculi.

Microscopic examination.—The tissue in all three lobes is of a rather glandular type, distinctly adenomatous portions varying with areas containing considerable stroma. There is the usual cystic degeneration, and intraacinous proliferation. The stroma is fairly equally composed of muscle and connective tissue. There is no prostatitis present.

Case 74.—*Moderate hypertrophy of lateral and median lobes. Cure.*

No. 881. J. R. G., age 61, married, admitted March 25, 1905.

Complaint.—"Prostatic hypertrophy. Catheterism."

Had gonorrhœa several times involving the testicles.

Present illness began about two years ago with slight difficulty of urination. Since then this difficulty has gradually gotten worse. In June, 1904, the patient had a severe attack of hematuria lasting about 24 hours. For a month following he had a slight amount of blood often before and often after urination. The patient has only had to get up at night to urinate for the past six months, but of late his frequency has grown much worse, and unless he uses a catheter at bed time he has to arise six or seven times during the night. On March 16, 1905, he had a chill followed by fever and pain in the back and his physician made a diagnosis of pyelitis.

Sexual powers.—About two years ago erections were weak and intercourse very unsatisfactory, emissions often occurring before introitus. This condition remained for over a year. For the past eight months intercourse has been fairly normal.

Examination.—The patient is well nourished with lips of good color. Heart, lungs, and abdomen are negative. There is no hernia present. The right epididymis is indurated.

Rectal examination.—External hemorrhoids are present in considerable mass. The prostate is markedly and symmetrically enlarged being approximately the size of a large lemon. The median furrow is shallow and the notch absent. It is smooth, soft. The seminal vesicles are palpable and not indurated and no enlarged glands are to be felt. The urine

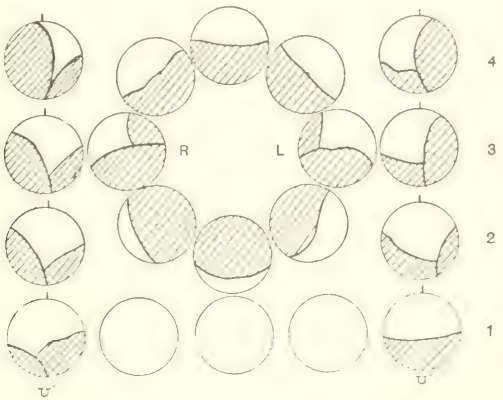


FIG. 46.—Case 74.

is cloudy, acid. Sp. gr. 1012, there is no sugar, but considerable albumin (5 per cent). Urea 14 gr. to the liter. Microscopically, pus cells and bacilli, no casts seen.

Cystoscopic examination.—A coudé catheter passes with ease and finds 100 cc. residual urine. This does not represent his residual as he was catheterized one hour before. (The true residual is 250 cc.) The bladder capacity is large and the tonicity is good. The cystoscope shows a fairly large middle lobe with a deep sulcus on each side of it, as shown in the accompanying chart, Fig. 46, R. and L. In series U' with the beak looking upward the handle is carried to the left so that as it is elevated it passes into the sulcus to the right of the middle lobe which becomes progressively prominent, as shown in 2, 3, and 4.

A corresponding set of pictures is shown by carrying the cystoscope into the sulcus to the left of the lateral lobe, as shown in series U-2, by carrying the handle of the cystoscope to the right with the beak again looking upward. The bladder wall is markedly trabeculated with numerous small pouches, but with no definite diverticula and no foreign bodies.

Preliminary treatment.—The patient was treated in the hospital one week before the operation, by hydrotherapy, urotropin, catheterization twice daily and vesical irrigation. During this time his highest temperature was 99.5°. The urine contained urea 17 gr. to the liter. The daily amount voided was from 1000 to 1300 cc., sp. gr. 1012.

Operation, March 30, 1905.—Perineal prostatectomy by the usual technique. The lateral lobes, which were moderately enlarged, were easily enucleated, and with the right lateral lobe the middle lobe, about 3 cm. in diameter, was removed in one piece. The urethra and ejaculatory ducts were preserved, only a small linear tear being made in removing the median lobe. The wound was closed as usual with double drainage tubes and light packing for the lateral cavities. An infusion was given on the table and continuous irrigation of the bladder on the return to the ward.

Convalescence.—The patient reacted well from the operation. Temperature on the day following was 100.8° and was fairly normal on the next day and remained so. The packing was pulled out on the day after the operation and the tubes on the following day. He was up in a wheelchair on the fourth day and began to walk on the 10th. The urine began to flow through the urethra on the fourth day, and the fistula finally closed on the 23d day. Interval urination was established as soon as the drainage tubes were removed, and there was no period of incontinence. On the 20th day the temperature arose to 102.5° and did not reach normal for four days. There was nothing found to explain the temperature, no epididymitis, and no pain. The patient was treated by active hydrotherapy and soon regained his strength. He was discharged on the 30th day, able to retain his urine three hours, the wound closed and no incontinence present. A silver catheter passed with ease meeting no obstruction and finding 10 cc. residual urine. Urinalysis showed pus, a small amount of albumin, and a few hyaline casts.

May 6, 1905.—Letter. I void urine three or four times at night, and have a slight leakage when the desire to urinate comes on. I drink water freely and take urotropin.

May 29, 1905.—I have gained nine pounds, sleep well, get up only once or twice at night and can retain my urine three and one-half hours during the day.

November 2, 1905.—Letter. I urinate on going to bed and do not void again until 6.30 in the morning. Erections have returned and I have had intercourse several times, twice fairly successfully with emissions.

November 30, 1905.—Letter. I void urine naturally, only once during the night, six to eight ounces at a time. I suffer no pain and consider myself cured. I have erections, but they are slight, and intercourse is not satisfactory as a rule.

May 9, 1906.—Letter. I void urine naturally, every three or four times during the day, and am not disturbed from bed time until morning. The amount voided is about eight ounces each time. I suffer no pain. I have erections and sexual intercourse which is not entirely satisfactory, erections as yet being somewhat imperfect. My general health is fine, I have gained 25 pounds and consider myself cured.

Pathological report.—The specimen, G. U. 145, consists of two pieces. The larger measures 8 x 4 x 3 cm. and comprises the median and right lateral lobe which have been removed in one piece. The left lateral lobe measures 3.5 x 3 x 2 cm. in size. The surface of the lobes is somewhat irregular with numerous small lobules, and on section spheroids with intervening fibrous stroma and occasional dilated acini are seen. The specimen weighs about G-40.

Microscopic examination.—The tissue is rather rich in stroma, moderately glandular areas alternating with areas containing mostly stroma. The acini are for the most part small, but occasionally areas where they are moderately dilated are seen. The epithelium lining the culs-de-sac usually consists of two layers, the superficial layer being cylindrical, and the deep layer on the basement membrane cuboidal type. There is considerable irregularity of the lumina of the acini. The stroma shows considerable young connective tissue, and there is a fair amount of muscle present. In some of the more fibrous areas the blood vessels show considerable arteriosclerotic change. There is present quite an extensive chronic glandular and interstitial prostatitis.

CASE 75.—*Moderate enlargement of median and lateral lobes. Small suburethral lobe. Irritable bladder. Cystitis. Pyelitis. Relief of obstruction. Cystitis persists. Examination 14 months after operation. Residual urine 20 cc. Contracted bladder. Small vesical calculus. Suprapubic lithotomy. Cured.*

No. 860. O. T. S., age 69, married, admitted March 4, 1905.

Complaint.—" Prostatic hypertrophy and difficulty in urination."

No history of gonorrhœa.

Present illness began five years ago with slight difficulty of urination and an intermittent frequency. After remaining the same for about two years the difficulty began to increase, but it did not become severe until November, 1904, when complete retention of urine came on. After one catheterization he was able to void, but he has been so uncomfortable that he has used a catheter three or four times a day since. Residual urine which at first was 11 ounces has recently been only three or four ounces. Two months ago he began to have a dull pain in the region of the right kidney which was very tender on pressure, and this condition persisted for four weeks.

S. P.—The patient is voiding urine very frequently and suffers considerable pain in the bladder. He catheterizes himself three times a day and finds from two to four ounces of residual urine. When the bladder is emptied with the catheter he has a sharp pain which is sometimes so severe as to require morphia.

Sexual powers.—Erections are still present, but sexual powers are unsatisfactory on account of pain on ejaculation.

Examination.—Patient is a well nourished man with lips of good color. His lungs are somewhat emphysematous, but the heart is negative. There is no enlargement or tenderness in the region of either kidney.

Genitalia.—The right globus major is somewhat indurated.

Rectal.—The prostate is moderately hypertrophied, contour is rounded, smooth. The left lobe is soft and the right slightly indurated. The median furrow and notch are shallow. The prostate is not adherent to surrounding structures. The seminal vesicles are not palpable, no glands are to be felt.

Urinalysis.—Urine is quite cloudy, acid, 1020, there is a small amount of sugar present, a trace of albumin, microscopically, a few pus cells and bacilli.

Preliminary treatment.—The patient was treated four days before operation. Urotropin, lithia water in abundance, diabetic diet, catheterization,



FIG. 47.—Median bar, small suburethral lobe, two lateral lobes, Case 75.

and vesical irrigation twice daily. Sp. gr. of the urine varied from 1010 to 1020, the sugar was in very small amount. Urination was very frequent, about every 15 minutes night and day, and there was considerable pain in the bladder.

Cystoscopic examination.—A catheter passes with ease and finds 50 cc. residual urine. Bladder is very small, holding only 175 cc. on forcible distention. Cystoscope shows a median bar and two slightly enlarged lateral lobes with a small sulcus in front. Cystoscopic examination was unsatisfactory on account of hemorrhage. No calculus was seen and using the cystoscope as a searcher it was impossible to feel one. With finger in

rectum and cystoscope in urethra the median portion of the prostate was thickened and lengthened.

Note.—During the six days in the hospital very little residual urine was obtained with the catheter, the bladder was very small and irritable, and urination was painful. Prostatectomy to be followed by vesical dilatation was advised.

Operation, March 10, 1905.—Ether. Perineal prostatectomy by the usual technique. The right lateral lobe was larger than the left, measuring 6 x 3 x 3 cm. in size. The median bar was removed partly through each lateral cavity, Fig. 47. Examination then showed a globular suburethral mass about the size of a cherry, this was shelled out with great ease without tearing the mucous membrane covering it. This seemed to be an enlargement of the prespermatic group of glands and was entirely suburethral. The floor of the urethra and ejaculatory ducts were not disturbed, but a slight tear was made in the lateral wall of the urethra on each side. A finger, inserted after removal of the tractor, showed no remaining enlargement. The bladder was searched with a long spoon and no calculus found. The wound was closed as usual with double catheter drainage for the bladder and light gauze packs for the lateral cavities. Patient stood the operation well. His pulse at the end was 75. Submammary infusion was given on the table, and intravesical irrigation after return to ward.

Convalescence.—The patient reacted well, the highest temperature being on the day after the operation, 100.4°; after three days it was practically normal. The gauze drain was removed in 18 hours and the tubes in 24 hours. He was out of bed in a wheel chair on the second day and began to walk on the third. Urine came through the penis on the second day and the fistula closed on the sixth day. Incontinence ceased on the fifth day, and at the end of two weeks the patient was holding his urine for two hours. The patient was discharged on the 23d day. At that time the wound was firmly healed, the urine was voided at intervals of two to three hours without hesitation or pain, a catheter passed with ease meeting no obstruction and finding no residual urine. The bladder capacity was 250 cc. No stone could be felt. Urine was slightly cloudy and contained pus and bacilli.

November 30, 1905.—Letter. I have not used a catheter, can void urine naturally, but micturition is accompanied by a scalding pain and occurs every two hours night and day.

The average amount voided was two ounces, the largest amount seven ounces. I have had no erections.

February 5, 1906.—Urination is still frequent and accompanied by a burning pain. The amount voided is usually one and one-half to two ounces. A catheter passes easily, shows no evidence of obstruction and finds no residual urine. The bladder is very irritable, the capacity is small, holding only 150 cc. on forced distention. The wound is healed, and rectal examination shows no remaining prostatic enlargement. No evidence of malignancy. The urine is acid and very purulent. The

patient's physician was advised to dilate the bladder forcibly by hydraulic with an idea of increasing the capacity and improving the cystitis. The frequency of urination is evidently due to irritable cystitis and contracture of the bladder.

May 14, 1906.—Patient returns for examination. He says that he has no difficulty in urination, but that he voids very frequently almost every hour night and day. Since the operation he has had several attacks of pain in the region of the right kidney, and during the past two months has passed about 40 small calculi. He has pain at the end of urination and in the end of the penis.

Examination.—The urine is cloudy and contains pus and bacilli. A coudè catheter passes with ease and finds 20 cc. residual urine, bladder capacity of 125 cc. and quite irritable. The cystoscope shows a small irregular white stone lying in the right half of the bladder but free. The vesical mucosa was markedly inflamed, trabeculated, and a shallow diverticulum was found in the left half. Study of the prostatic orifice shows a small but definite rounded median enlargement with a cleft on each side.

Operation, May 18, 1906.—Ether. Suprapubic cystotomy. Two small calculi were found and removed. Examination showed a large prostatic orifice which easily admitted the index finger. The lateral lobes were not at all enlarged. In the median portion there was a small transverse fold of mucous membrane about 8 mm. thick which was soft and flabby, but distinctly elevated above the trigone. Although the prostatic orifice was very large, and the presence of only 20 cc. of residual urine showed that there was very little obstruction, it was thought best to excise this median fold. It was accordingly caught between clamps and excised and a piece of tissue about 2 cm. wide and 1 cm. deep excised with the scissors coming away in two pieces. Examination showed mucous membrane and fibrous tissue, no evidence of prostatic glands. There was only a moderate amount of bleeding and the bladder was closed completely with interrupted catgut sutures. The recti muscles and skin were drawn together with interrupted sutures of silver wire, with a small gauze drainage at the lower angle.

Convalescence.—Immediately after the operation there was considerable intravesical hemorrhage with complete retention of urine. It was necessary to pass catheters several times to evacuate clots of blood. The patient suffered a great deal of pain and became quite weak. It was evident that the bladder should not have been completely closed as it broke down the following day. For a week the patient was very exhausted and his condition was serious, but during the second week he rallied. On the 14th day a catheter was fastened in the urethra to hasten closure of the suprapubic fistula. It was removed at the end of nine days, but the fistula did not heal until four days later, 26 days after the operation.

June 15, 1906.—The patient is in good condition, the fistula has been closed for three days, he voids urine without pain, has no incontinence and can retain it for three hours.

Pathological report.—The specimen, G. U. 139. The prostate has been removed in four pieces and weighs 3 G. The right lateral lobe is the larger, and measures 5 x 3 x 2 cm., the left lateral measures 3 x 2 x 2 cm. The median bar is an irregular mass 3.5 x 2 x 1.5 cm. in size. A sub-urethral lobule measures 2 x1.5 x 1.5 cm. is smooth and has a smooth capsule. The relative arrangement of these lobes is shown in the accompanying photograph. The lateral lobes are composed of irregular spheroids, and the median bar is of similar structure. The sub-urethral lobule is much firmer, and almost homogeneous.

Microscopic examination.—In the right lobe the hypertrophy is a rather lobulated glandular one with dilatation and cystic degeneration of the acini. The stroma is largely composed of fibrous tissue, and there has been a great deal of new inflammatory tissue formation. In areas the new formed fibrous tissue is leading to compression of the acini. The suburethral lobe is almost entirely fibrous, only occasionally does one encounter the vestige of an acinous. There is present very marked round cell and polynuclear infiltration with formation of new inflammatory tissue. The arteries are markedly sclerosed. In the right lobe the arteries show practically no thickening.

CASE 76.—*Moderate enlargement of median and lateral lobes. Catheterism twice daily. Cure. Followed 14 months.*

No. 853. F. H. W., age 63, married, admitted March 7, 1905.

Complaint.—" Prostatic enlargement. Frequency of urination."

Had chronic gonorrhœa for years in his youth..

Present illness began about 15 years ago with slight difficulty of urination and dribbling at the end. Had very little trouble until five years ago after which there was a considerable increase in his urinary difficulty and frequency. Has never had complete retention of urine, but three months ago on the advice of a physician he began the use of a catheter at bed time. Has had only slight amount of pain and entirely confined to the bladder. No hematuria.

S. P.—The patient catheterizes himself at bed time and after that he does not void until morning, but then voids every hour until catheterized again. He has slight dribbling at the end of urination, but suffers no pain.

Sexual powers.—Good.

Examination.—The patient is a sturdy looking man with lips of good color. The chest and abdomen are negative.

Rectal.—The prostate is moderately enlarged, smooth, firm, but not markedly indurated. The seminal vesicles are negative.

Urinalysis.—Cloudy, alkaline, sp. gr. 1016, no albumin, no sugar, urea G-12 to liter. Microscopically, pus cells and bacilli.

Cystoscopic.—A coudé catheter passes with ease and finds 200 cc. residual urine. The bladder capacity is about 250 cc. The cystoscope shows very slightly hypertrophied lateral lobes with a shallow sulcus between them in front. There is a small but definite median bar with no sulci on either

side behind which the ureters and most of the trigone can be easily seen. With finger in rectum and cystoscope in urethra the median portion of the prostate is found to be only moderately thicker than normal.

Operation, March 17, 1905.—Ether. Perineal prostatectomy by the usual technique. The left lateral lobe was smaller than the right, but this was only moderately enlarged, both were easily enucleated. The median bar was removed in one piece with the right lateral lobe and left a cavity beneath the urethra which formed a communication between the two lateral cavities. The urethra above it and the ejaculatory ducts behind it were not injured. After removal of the tractor a finger in the bladder showed no remaining enlargement. The wound was closed as usual with double drainage tubes and light packs for the lateral cavities.

The patient stood the operation well, pulse at the end 72. Continuous irrigation and infusion on return to ward.

Convalescence.—On the second day after the operation the temperature arose to 103°, but fell to normal the next day, and afterwards did not rise above 100°. The irrigation was discontinued after 10 hours, the tubes removed in 18 hours and the gauze packing in 24 hours. The patient was out of bed on the fourth day, was walking on the sixth, began to pass urine through the anterior urethra on the fifth day, and the fistula closed on the 17th day. He had an erection five days after the operation. He was discharged from the hospital on the 20th day. At that time he retained his urine for four hours, had no incontinence, except a slight leakage when his bladder became very full. The wound was healed. A catheter passed with ease and found no residual urine and the bladder capacity 225 cc.

May 19, 1905.—The wound opened slightly and a fistula formed after returning home. I can retain urine for six hours and am perfectly well.

July 20, 1905.—Letter. The fistula healed after several curettements. His cystitis troubles him somewhat.

November 30, 1905.—Letter. I void urine naturally, and often do not get up at night to urinate at all. The amount voided is about four ounces and I suffer no pain, the wound is healed and I consider myself cured. I have erections but seldom, and intercourse is not entirely satisfactory. My general health is excellent.

May 8, 1906.—Letter. I void urine as well as I ever could, at intervals of four hours during the day and only occasionally rise at night. My general health is excellent, I have gained 16 pounds and am completely cured.

Pathological report.—The specimen, G. U. 142, consists of the three lobes of the prostate each removed in one piece, and weighs about G-21. The median lobe is the largest and measures 2.5 cm. in diameter. The lateral lobes measure 2.5 x 2.5 x 2 cm. in size. The appearance of the three lobes is about the same, the external surface being irregular, and the cut surface showing considerable stroma. Very few dilated acini. No ejaculatory ducts.

Microscopic examination.—The hypertrophy is a moderately glandular one, the usual characteristic appearance alternating with broad bands of

stroma in which the acini are small and rather compressed. The interstitial bands interlacing in the lobules are unusually broad, while in the areas outside, the stroma is, as a rule, in excess of the gland tissue. Fairly numerous areas of interstitial and glandular prostatitis are present. The stroma distinctly contains more muscle than connective tissue.

CASE 77.—*Small sclerotic prostate. Vesiculitis. Residual urine 500 cc. Cured.*

No. 871. T. J. E., age 67, married, admitted March 14, 1905.

Complaint.—" Frequency of urination and incontinence."

Gonorrhœa 25 years ago, slight attack.

Present illness began three years ago with frequency of urination. About the same time began to have slight incontinence. The trouble increased rapidly, and it soon became necessary to defecate in order to urinate. At present he urinates about every two hours, and has great difficulty in starting the flow of urine unless his bowels move at the same time so that he has practiced the habit of defecating at each urination. Urine escapes involuntarily in varying amounts both night and day so that it is necessary for him to wear a rubber receptacle. Pain has not been a prominent symptom and he has not lost weight. He has never had complete retention of urine, and no hematuria.

Sexual powers.—Occasionally he has partial erections, but he has been unable to have intercourse for two years.

Examination.—The patient is a large healthy looking man, his lips are of good color. The lungs are clear. There is a slight systolic murmur at the apex, but the pulse is good. Abdomen is negative. There is a right inguinal hernia present which is easily reduced.

Rectal.—The prostate is not much larger than normal and does not bulge towards the rectum, but the outlines are difficult to make out, the surface being irregular, hard in places and soft in others, but there is no stony induration, and no periprostatic induration or glands. The seminal vesicles are both indurated and irregular. Above the prostate and running from one seminal vesicle to the other is an indurated band.

Urinalysis.—Clear, amber. First glass contains a few shreds composed of epithelium. Second and third glasses are clear and contain no shreds. The urine is acid. 1012, no albumin, no sugar. Urea G-12.5 per liter. Microscopically negative for bacteria and pus cells.

Cystoscopic.—A catheter passes with ease and finds 500 cc. residual urine. The cystoscope shows very little enlargement of the lateral lobes, and only a slightly enlarged median bar behind which the ureters and most of the trigone can be seen.

Preliminary treatment.—The patient was catheterized twice daily and took urotropin 20 grains a day. Examination of reflexes showed no evidence of spinal cord disease, and although the prostate was very little enlarged, the amount of residual urine was considerable and perineal prostatectomy seemed advisable.

Operation, March 18, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were very little enlarged, hard and very adherent. The median bar of the prostate was removed partly with each lateral lobe. It was found to be continuous with structures beneath the trigone and scissors were used to remove it. Examination with the finger in the urethra showed that the median bar had been completely removed, but the vesical orifice was still quite constricted, but dilated easily with the finger. Examination of the specimen showed that both ejaculatory ducts had been removed along with the median bar to which they were closely attached by firm fibrous adhesions. This was a second instance in which they were unintentionally removed and in no other specimens have the ducts been found. The wound was closed as usual, but the hemorrhage was so slight that no drainage tube was inserted, the lateral cavities being lightly packed with gauze. Infusion on return to ward. The patient stood the operation well, the pulse at the end being 96.

Convalescence.—The patient reacted well. The temperature rose to 101° on the day after the operation, but on the next day it was normal. The gauze packing was removed within 24 hours and the patient was up in a wheel chair on the second day, his condition being excellent. On the eighth day slight epididymitis appeared on the right side, but under treatment with ice it rapidly disappeared, and in five days his condition was excellent. The urine did not come through the anterior urethra until the 19th day, and the perineal fistula did not close finally until the 44th day. From April 6th to the 21st, there was an evening rise of temperature, at times as high as 102° and during this time the patient was drowsy, hard to get out of bed and had very little appetite. After that he was free from temperature and improved rapidly in strength. He left the hospital on the 51st day in good condition, able to retain his urine four hours at night and three hours during the day, no dribbling, stream satisfactory. His bowels moved only once or twice during the day and he had good control of his rectal sphincter (which he had not had for five years).

Examination.—Urine is voided in a good stream, but it is cloudy and contains bacilli in large number. The perineal wound is healed. Rectal examination shows the usual amount of scar tissue. The seminal vesicles are indurated, but there is nothing to suggest malignancy.

May 25, 1905.—I can retain urine three or four hours and have perfect control. I do not have to evacuate my bowels during urination.

September 21, 1905.—I have not felt better for 30 years. I sleep well. Usually awake at 2 a. m. to urinate.

December 1, 1905.—I have gained 12 pounds in weight. I often sleep until 4 o'clock in the morning before urinating. I can void one pint at a time, have only a slight irritation in the morning, the wound is closed and I consider myself cured.

February 14, 1906.—Letter. My frequency of urination depends upon my nervousness. If I know a urinal is not convenient I get nervous and the desire to urinate comes on much sooner than when I am at home where

I am able to retain urine for two hours. At times the stream is almost perfect, at others spiral and forked.. I generally void urine at two and at five during the night. Sometimes I pass as much as eight ounces at a time. There is a sympathy between the bladder and rectum, and if I retain the urine beyond a certain point I must empty the rectum with the bladder. I suffer irritation but cannot call it pain, and it seems to depend upon my nervous condition. When quiet I have no irritation for hours. My general health is better, notwithstanding that I have been operated upon for cataract.

May 4, 1906.—The wound has remained healed, I void urine naturally, about three-quarters of a pint at a time. I do not use a catheter and have only a slight pain when the bladder becomes full. My general health is good and I consider myself very much improved.

Pathological report.—The specimen, G. U. 141, consists of the lateral lobes of the prostate each in one piece. The right lobe measures 3 x 2.5 x 2 cm. in size. The surface is irregular, and at its upper end is a mass of tissue about 1 cm. in diameter containing the ejaculatory duct, which is very easily seen, being about 3 mm. in diameter and with a thick white wall. The left lobe measures 3 x 3 x 2 cm. in size and has a similar mass attached to its upper end which contains the ejaculatory duct. Section of the prostatic lobe shows spheroids, but more fibrous stroma than usual. The prostate weighs about 20 grams.

Microscopic examination.—The hypertrophy is distinctly of the fibro-muscular type there being comparatively no gland acini present. In considerable areas almost pure bundles of muscle fibers are present while in other areas the fibrous tissue predominates. The few acini which are present are dilated, and lined by two layers of rather flat epithelium. Everywhere is present much embryonic connective tissue. As a whole the muscle element is considerably in excess of the connective tissue, although here and there one sees a rather fibrous nodule with some round cell infiltration, but even here distinct muscle fibers are present. The arteries show a moderate degree of arteriosclerosis, and at times, especially in the larger vessels, the thickening is marked. There is present everywhere a well marked prostatitis.

CASE 78.—*Moderate hypertrophy of median and lateral lobes. Complete retention of urine. Catheter life. Cured. Followed 14 months.*

No. 877. E. H. S., age 65, married, admitted March 24, 1905.

Complaint.—"Enlarged prostate. Catheterism."

No history of gonorrhœa.

Present illness began five years ago with frequency and precipitancy of urination. Trouble gradually increased, and four months ago the patient found that his lower abdomen was enlarged. He was catheterized and a large amount of residual urine withdrawn. Since then the patient has been unable to void urine and has catheterized himself three times a day. Has never had pain nor hematuria.

Sexual powers.—Erections are imperfect and as a rule not sufficient for entrance. Sexual intercourse very unsatisfactory.

Examination.—The patient is a healthy looking man. Chest, lungs, and abdomen negative.

Rectal examination.—The prostate is only moderately enlarged, soft and does not suggest malignancy.

Urinalysis.—Cloudy, acid, sp. gr. 1023, albumin in slight amount, no sugar, urea 24 gr. to the liter. Microscopically, pus cells, bacilli, and cocci.

Cystoscopic examination.—A catheter passes with ease, the bladder is large, tonicity good, retention of urine complete. The cystoscope shows a moderately large median lobe and moderate intravesical hypertrophy of the lateral lobes. The bladder is trabeculated and there is a moderate cystitis. No stone present.

Operation, March 27, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes which were moderately enlarged were removed each in one piece. The median bar and a pedunculated lobe, which was attached to it, were removed in one piece through the right lateral cavity. A small tear was made in the urethra but no mucous membrane was removed and the ejaculatory ducts were preserved. The finger was inserted into the bladder and showed no remaining prostatic enlargement. The wound was closed as usual with double catheter drainage and light gauze packs for the lateral cavities. The patient stood the operation well, the pulse at the end was 90. On return to ward an infusion was given and continuous intravesical irrigation was begun.

Convalescence.—The patient reacted well. The temperature reached 101° on the day after the operation, but was normal after the second day. Gauze was removed in 24 hours and the irrigation stopped. The tubes were removed the next day, and the patient was up in a chair. He began to walk about the ward on the fourth day. Interval urination was established after the removal of the tubes, at first every hour, but the interval rapidly increased. On the seventh day urine came through the penis and the fistula closed on the 18th day. Broke open two days later. The patient was discharged on the 26th day. There was still a pin point fistula. Patient had no incontinence, was able to hold urine for five hours, and suffered no pain. A small silver catheter passed with ease and found 30 cc. residual urine. The fistula was curetted and the patient instructed to take urotropin, lithia water in abundance and to retain urine as long as possible to distend the bladder. (The fistula closed on the 46th day.)

November 30, 1905.—Letter. The fistula closed soon after my return. I have had no instrumentation. Void urine once at night and four times during the day. Micturition is normal, I have no pain and I consider myself cured. Erections occur occasionally and intercourse is satisfactory.

May 8, 1906.—Letter. I void urine at natural intervals, suffer no pain. I have no erections. My general health is excellent. I consider myself cured.

Pathological report.—The specimen, G. U. 144, consists of the median and lateral lobes of the prostate removed in three pieces, and weighing G-43.

The median lobe is composed of irregular lobules and measures 5 x 2.5 x 1.5 cm. The right lobe measures 5 x 3 x 2.5 cm. The left lobe 5 x 3 x 2 cm. The consistence is everywhere elastic, and on section shows typical adenomatous spheroids.

Microscopic examination.—The hypertrophy is a lobulated glandular one. The acini show the usual dilatation with occasional cystic degeneration. The epithelium lining the acini is usually two layers in thickness although occasionally one sees solid epithelial cones many layers in depth, and again slender bands of connective tissue growing into other epithelial masses which would seem to represent new glands in the process of formation. This picture is frequently seen in these glandular prostates. The stroma is rather loose, and contains considerable new connective tissue, even in areas where there is no inflammatory infiltration and even where there is no prostatitis in the immediate neighborhood. There is a fair amount of muscle present, and some areas of chronic prostatitis.

CASE 79.—*Considerable hypertrophy of lateral lobes. Small median bar. Intermittent attacks of great frequency and difficulty of urination. Cure. Followed 14 months.*

No. 879. A. H. L., age 68, widowed, admitted March 25, 1905.

Complaint.—" Difficulty in passing urine."

No history of gonorrhœa.

Present illness began about five years ago with slight difficulty and frequency of urination. This had gradually increased until the patient now voids every half hour during the morning, but during the rest of the day he is fairly comfortable and at times in the afternoon he will not urinate for three hours and as a rule only gets up once at night. Urine is passed only after considerable straining and the stream is small. He has been catheterized several times, but never on account of retention. Two years ago he had hematuria lasting 24 hours, and several months later a similar attack, but there was no pain in the kidney, bladder, or penis. He has not lost weight, his erections are fairly good, but he has not had intercourse for years.

S. P.—The patient urinates at intervals varying from two to four hours, but occasionally there are periods during which urination is very frequent and the bladder very irritable. He usually arises only once at night.

Examination.—The patient is sturdy in appearance and his lips are of good color. Chest and abdomen negative. A large right inguinal hernia is present. The testicles and epididymis are normal.

Rectal examination.—The prostate is considerably enlarged particularly in its transverse diameter which is at least twice as great as normal. The median furrow is wide and the notch is fairly deep. The surface is smooth, rounded, elastic, the seminal vesicles are not indurated.

Urine.—Cloudy, alkaline, 1020. Albumin moderate. Microscopically, pus cells, no bacteria seen.

Cystoscopic examination.—A small coudé catheter passes and meets with considerable obstruction before entering the bladder. Only 25 cc. residual

urine present. Bladder capacity is 240 cc., the tonicity is good. The cystoscope shows a medium sized sessile middle lobe with a shallow sulcus on each side. The lateral do not project much into the bladder and there is no cleft between them in front. With the finger in the rectum and cystoscope in the urethra a considerable increase in the median portion of the prostate is made out. There was no foreign body present.

Operation, March 30, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were of considerable size and easily enucleated. The median lobe was drawn down into the left lateral cavity without injury of the urethra, bladder or ejaculatory ducts. The middle lobe was about 2½ cm. in diameter. Owing to the absence of cystitis the operator did not insert a catheter into the bladder, but packed the lateral cavities lightly with gauze. The patient was infused, and the wound closed as usual. The patient stood the operation well.

Convalescence.—There was more hemorrhage than usual during the night after the operation, but the pulse which was 74 at the end of the operation did not go above 84 during the night. The gauze was removed 16 hours after the operation, at that time hemorrhage had ceased and condition of the patient was excellent. The patient was up in a wheel chair on the fourth day and on this day the urine began to come through the penis, but the fistula did not close finally until the 20th day. Immediately after the operation the patient was able to retain urine for a definite interval. Since then the time between urinations has increased and on the 21st day he was voiding urine every five hours. There was no incontinence but urination was often urgent, and the sphincter weak, so that when he coughs a few drops may escape. Erections returned two weeks after the operation. He was discharged from the hospital on the 28th day. The wound healed. Voiding urine every five hours without pain and with good force. The urine before operation was clear, 1020, contained albumin and a few pus cells, but no bacteria.

On the 15th day the patient developed fever without explainable cause. There was no epididymitis, no renal or lung complication. It began with a temperature of 102.5°, but after three days it was almost normal.

July 20, 1905.—Report by his physician. This case has been eminently satisfactory. There is no cystitis, no fistula.

November 30, 1905.—Letter. Urine passes without difficulty, several times during the day and once at night. I have no pain, but there is still sensitiveness in the bladder and occasionally I have to void urine three times at night on this account. Erections have returned. My general health is excellent and I have gained in weight.

May 21, 1906.—Letter. I void urine naturally at intervals of from three to five hours, and frequently none at all at night. I suffer no pain, erections have returned. I have had no complications and no treatment. My general health is good, and I consider the operation entirely satisfactory.

Pathological report.—The specimen, G. U. 146, consists of four pieces

and weighs about G-55. The median lobe is in the shape of a globular mass about 2½ cm. in diameter with a smooth outer surface. On section it shows considerable gland tissue with little stroma. The left lateral lobe has been removed in one piece, and measures about 4 x 4 x 3 cm. The surface is fairly smooth, encapsulated. On section there is considerable stroma and many dilated acini. The right lobe has been removed in two pieces, both of which are considerably torn. It presents a similar appearance to the left. No mucous membrane, no ejaculatory ducts are present, no calculus present.

Microscopic examination.—Microscopically the tissue is a moderately glandular one with the formation of spherical lobules. There is a considerable amount of stroma present. Within the lobulated areas the stroma is more evident than one sees in many of these similar hypertrophies. The acini are moderately dilated and in areas there is fairly well marked cystic degeneration. The stroma contains much more fibrous tissue than muscle. In the interlobular areas the stroma is more abundant, but there is present a fair amount of glandular element. Some areas of small round cell infiltration are seen. Numerous corpora amylacea are present in the ducts. The arteries are apparently not undergoing any sclerotic changes.

Case 80.—*Large hypertrophy of median and lateral lobes. Emphysema of lungs, cardiac murmur. Casts in urine. Cure. Followed 13 months.*

No. 1331. J. M., age 65, single, admitted March 5, 1905.

Complaint.—"Retention of urine."

Patient had gonorrhœa at the age of 24 and again at the age of 34. No epididymitis with either attack.

Present illness.—For 15 years the patient has had a slight increased frequency of urination, but no dysuria. In October, 1903, he had complete retention of urine requiring catheterization. After this he remained fairly well but for frequency of urination until one week ago. Since then he has been unable to void and has been catheterized twice a day with extreme difficulty. He is weak and has lost weight.

Sexual powers.—Normal.

Examination.—The patient is sturdy, his lips are of good color.

Lungs.—Everywhere hyperresonant, mucous râles over both bases. Heart negative except slight presystolic rumble at apex. The abdomen is negative.

Rectal.—Prostate is considerably and symmetrically enlarged, smooth, elastic. There is no induration in the region of the seminal vesicles, no tenderness.

Cystoscopic.—The patient was able to void 15 cc. and was catheterized immediately afterward, residual urine 240 cc., bladder capacity 300 cc. The cystoscope shows a large globular median lobe with a deep sulcus on each side. The lateral lobes are very little intravesically hypertrophied and there is no sulcus between them in front. With finger in rectum and cystoscope in urethra there is considerable increase in the median portion.

Preliminary treatment.—Continuous drainage through a permanent cath-

eter, vesical irrigations, urotropin, large amounts of water by mouth. Under this treatment the urea increased from 28 gm. to 36 gm., and the total solids from 44 gm. to 52 gm. The urine contained pus cells, a few hyaline casts. Sp. gr. 1015 to 1025, albumin a trace.

Operation, April 6, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes which measured 3 x 4 x 6 cm. in size were each removed in one piece without tearing the mucous membrane. A small portion of the median lobe was removed with the right lateral lobe. Most of the median lobe was found drawn well down along the urethra by the tractor by the rotation and traction on the instrument. It was very adherent to the mucous membrane and a small area of this was removed adherent to the lobe. Examination with the finger showed no remaining enlargement. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. The patient stood the operation well, pulse at end 90. Continuous irrigation and infusion on return to the ward.

Convalescence.—The patient reacted well. The highest temperature was on the fourth day after the operation, 102°, after that practically normal. The gauze and catheters were removed on the day after the operation, and the patient was up in a wheel chair the next day and walked on the third day. On the fifth day a very slight epididymitis developed on the right side which disappeared quickly under ice bag treatment. The temperature did not remain elevated for more than two days. The urine did not flow through the anterior urethra until the 17th day, and the patient was discharged on the 20th day. The wound had healed per primam, there was a pin point fistula through which only a few drops of urine escaped, and he was able to retain urine for four hours and suffered no pain. General condition excellent. The fistula finally closed on the 25th day.

February 20, 1906.—Letter. The wound has remained healed, I void just like a boy, have no dribbling. Urinate at intervals of five or six hours in the day and six or seven hours in the night. I suffer no pain. Erections have returned and sexual intercourse is normal and entirely satisfactory. Ejaculations profuse. I have had no complications and my health is fine.

May 6, 1906.—Letter. I void urine naturally at normal intervals, about six ounces at a time. I have no pain. I have erections and satisfactory intercourse, the act being the same as before operation. My general health is good, I have gained 40 pounds and I consider myself cured.

Pathological report.—The specimen, G. U. 147, consists of the three lobes of the prostate removed each in one piece and weighs about 20 gm. The right lobe measures 4 x 2.5 x 2 cm., is fairly smooth, elastic, and on section shows a little capsule, fairly homogeneous surface with few spheroids, few dilated acini and little stroma. The left lobe is about the same size as the right, but seems to contain more stroma. The median lobe measures 3 x 2 x 1.5 cm., and is similar in appearance to the others. No mucous membrane, no ejaculatory ducts, no calculi.

Microscopic examination.—In the right lateral the tissue contains very

distinct lobules which are mostly composed of adenomatous tissue, and between these lobules are bands containing a fair number of glandular culs-de-sac. The acini within the lobules show considerably more dilatation and evidence of glandular proliferation than do the acini in the stroma outside. In the interstitial tissue between these glandular lobules there is a very marked prostatitis present, the lumina of the culs-de-sac being often filled with leucocytes and epithelial cells. The inflammatory infiltration in places is almost of sufficient density to suggest abscess formation. The prostatitis, however, does not seem to have invaded these glandular lobules, although they are surrounded on all sides by the inflammatory processes.

The left lobe is distinctly less glandular than the right, and there seems to be no formation of spherical lobules. There is everywhere present a diffuse prostatitis, the ducts being filled with leucocytes and epithelial cells and the interstitial tissue infiltrated.

The picture in the left lobe is almost purely one of prostatitis with very little evidence of gland proiferation.

CASE 81.—*Moderate hypertrophy. Two calculi. Incomplete retention. Cure.*

No. 888. C. A., age 62, married, admitted April 11, 1905.

Complaint.—" Bladder trouble."

Gonorrhœa at the age of 32, followed by gleet, no stricture.

Present illness began 12 years ago with a sudden attack of retention of urine, requiring catheterization for two days. After that the course of the disease was characterized by gradual increase in difficulty and frequency which has been considerably worse during the past few years—no pain, but occasionally slight hematuria.

S. P.—Urination every hour during the night, every one and one-half hour during the day. For the past two months there has been a slight pain during urination, and occasionally hemorrhage.

Sexual powers.—Erections, ejaculations and coitus normal.

Examination.—Patient is a sturdy looking man. Chest and abdomen negative.

Rectal.—The prostate is enlarged, but only moderately. It is smooth, elastic, fairly firm. The median furrow is shallow and the notch absent. At the upper end of the right lateral lobe is a small, hard, round mass which projects upward towards the seminal vesicle which is not indurated. The left seminal vesicle was also normal, and there are no adhesions.

Urinalysis.—Very cloudy, alkaline, sp. gr. 1015, no sugar, albumin in moderate amount. Urea 10 gm. to the liter. Microscopically, bacilli, cocci and pus cells.

Cystoscopic.—A coudé catheter passes with ease and finds 150 cc. residual urine. The bladder is contracted and holds only 250 cc. The cystoscope shows very little enlargement of the lateral lobes, but a distinct, though small, median enlargement with a sulcus on each side. The mucous membrane covering the median lobe is extremely red and two large

granulations are seen on its apex. The bladder is markedly trabeculated, and contains two small oval, white calculi. No diverticula seen. With finger in rectum and cystoscope in urethra, the beak of the instrument is indistinctly felt, the median portion of the prostate is considerably increased.

Operation, April 11, 1905.—Ether. Perineal prostatectomy by the usual technique. Removal of two calculi through wound. The lateral lobes which were easily enucleated were only moderately enlarged. A large median lobe about the size of a walnut was enucleated through one of the lateral cavities. The urethra was then divided longitudinally along the left lateral wall, the neck of the bladder dilated, forceps inserted and two calculi removed without crushing; no additional calculi were found.

The wound was closed as usual with double catheter drainage and light packs for the lateral cavities. Infusion and continuous irrigation on return to ward. Pulse at end of operation was 95.

Convalescence.—The patient reacted well, the temperature rising on the second day to 100.6°, but normal after the second day. The continuous irrigation was discontinued after 14 hours, gauze was removed in 24 hours, the tubes in 48. Urine passed through the anterior urethra on the third day, and the fistula closed on the 25th day. He left the hospital on the 30th day in good condition, able to retain urine for four hours during the day and voiding only twice during the night. No incontinence, stream large. Silver catheter passed with ease and found no residual urine. No complications after the operation.

Letter from physician.—Our patient holds his water for six hours and is in excellent shape, but complains of considerable "smarting" at times. He passed concretions the size of a pea two or three weeks ago.

Letter from physician.—Patient has continued to have pain at the end of urination, and on examination with the searcher I find a calculus. What operation would you advise? (Suprapubic lithotomy was advised.)

August 15, 1905.—Operation by his physician. Suprapubic cystotomy, removal of a calculus one inch in diameter, closure of bladder with catgut. The prostatic orifice was examined with a finger in the bladder and presented a normal appearance.

Convalescence.—The suprapubic wound leaked slightly on the seventh day, but after the tenth day there was no leakage. He had no complications.

February 12, 1906.—Letter from physician. Both wounds are closed. Urine is voided naturally, he is able to retain it from six to eight hours and does not get up at night. He has no pain. Sexual powers are normal, and intercourse the same as before operation. His general health is good.

May 10, 1906.—Letter. I void urine naturally three or four times a day and twice at night, half a pint at a time. I suffer no pain. Have erections and satisfactory intercourse. My general health is excellent, and I consider myself cured.

Pathological report.—The specimen, G. U. 148, consists of the three lobes of the prostate each removed in one piece and weighs about 30 gm. The

left lobe measures 5 x 4 x 3 cm., is somewhat irregular, and on section shows considerable stroma, and only a moderate amount of gland tissue. The right lobe measures 6 x 3 x 1.5 cm., and is similar in character to the left. The median lobe measures 6.5 x 3 x 3 cm., and in its lower portion presents a small round nodule about 1.5 cm. in diameter which was distinctly suburethral. On section there is considerable gland tissue and a small amount of stroma. No mucous membrane, no ducts. Two stones, each measuring 6.5 x 3.5 x 1.5 cm. have been removed.

Microscopic examination.—The middle and left lobes show stroma and gland tissue in about equal proportions. The gland tissue is aggregated in areas with rather broad bands of stroma intervening. Within the glandular areas the acini are moderately dilated with an occasional cystic degeneration of an acinus. As a rule the acini show considerable complexity due to intraacinous proliferation. The acini within the broad bands of stroma are as a rule much compressed. The stroma contains a fair amount of muscle. The right lobe has distinctly less gland tissue than either of the other lobes, and there is present quite a marked prostatitis with the formation of considerable inflammatory tissue and atrophy of acini. The fibro-muscular type, as a whole, predominates, although richly glandular areas are present.

Case 82.—*Severe stricture of urethra, involving prostate, complete retention of urine and catheter life for eight years. Multiple diverticula. Prostatectomy, urethrotomy. Cure.*

No. 848. J. P. C., age 54, married, admitted March 18, 1905.

Complaint.—" Stricture of urethra. Complete retention of urine. Catheterism."

Twelve years before, the patient had had gonorrhœa, which was followed by a stricture which gradually became worse, urination more difficult, and eight years ago complete retention of urine. Under chloroform a sound was forcibly passed into his bladder and a false passage produced. Since then he has never been able to void urine and has had to lead a catheter life. During this time he has had several operations performed for the stricture. Internal urethrotomy, external urethrotomy and frequent dilatation, but at no time has he been able to void.

S. P.—He now catheterizes himself with a small silver catheter every three hours night and day. Sexual powers are normal. General health good.

Examination.—The patient is a well nourished man with lips of good color. Chest and abdomen negative. The right testicle is markedly atrophic.

Rectal.—Slight hemorrhoids are present. Prostate is normal in size and consistence, with exception of the upper portion of the left lateral lobe in which there is an induration which extends upward and involves the left seminal vesicle and vas. On the right side there is a small nodule at the junction of the vesicle and prostate.

Urethral.—In the bulbo-membranous portion of the urethra there is a

hard stricture which will not admit a No. 24 F. sound, a filiform and followers are passed, but are tightly grasped in the membranous and prostatic urethra. A small silver catheter now passes with ease, and finds a bladder capacity of 270 cc. The cystoscope shows an enlargement of each lateral lobe, but the enlargement is almost entirely intraurethral, presenting as two lateral intraurethral rounded lobules with a small transverse median fold behind them, as shown in the cystoscopic charts in article on cystoscopy of the prostate, Case XXI. The bladder is markedly trabeculated and the orifices of five diverticula are seen. With finger in rectum and cystoscope in urethra there is very little increase in the median portion of the prostate.

Urinalysis.—Neutral, 1020, no sugar, trace of albumin, urea 15 gm. to liter. Microscopically, pus and bacilli.

Remark.—Urethral and rectal examination seem to show that the obstruction was due to a stricture of the urethra, but internal and external urethrotomy and frequent dilatations of the urethra had failed to restore even temporarily the power of urination. It seemed evident therefore that the interurethral prostatic lobules were the cause of the complete retention of urine, and perineal prostatectomy was therefore advised.

Operation, April 12, 1905.—Ether. Perineal prostatectomy by the usual technique. Longitudinal division of extensive stricture of bulbo-membranous urethra. An inverted Y incision was made. The bulb of the urethra was exposed and found to be very greatly indurated and the membranous urethra was surrounded by a considerable amount of fibrous tissue, and the rectum was so closely adherent that it had to be dissected free with great care. The membranous urethra is opened upon a small staff, but it was impossible to insert a sound until it had been dilated with forceps. The lateral lobes were very little enlarged, very adherent, and the sharp periosteal elevator had to be used in freeing them from the vesical mucosa. The median bar was removed in two pieces through the left lateral cavity with scissors. Examination with the finger after removal of the tractor showed no remaining enlargement, and the large diverticulum back of the left ureter easily admitted the finger. Double catheter drains and lateral gauze packs were then inserted and attention then directed to strictured membranous and bulbous urethra, which were opened longitudinally upon a grooved sound. The urethra was found to be surrounded by dense fibrous tissue from 5 to 8 mm. thick. The bulb was completely transformed to fibrous tissue, and did not bleed. The mucous membrane of the urethra was white and looked like skin. The superior wall of the urethra was also divided along the strictured region. Pack was then placed into the urethral wound and the lateral branches of the incision were closed with catgut. The patient stood the operation well. His pulse at the end was 105. His condition excellent. Salt solution and continuous irrigation on return to the ward.

Convalescence.—The patient reacted well, but on the day after the operation the temperature rose to 104°, but two days later returned to normal, and after that there was very little rise. The continuous irrigation

was stopped at the end of 12 hours, the gauze removed within 24 hours, and the tubes in 48 hours. Urine first passed through the anterior urethra on the 18th day and the fistula closed on the 30th day. Interval urination was established immediately after the removal of the tubes on the second day, and on his discharge from the hospital on the 40th day, he was able to retain urine for four hours, voided with a large strong stream, and had no pain. An attempt was made to pass a catheter, but it was caught in a pocket in the bulbous urethra. Filiforms were arrested in the prostatic urethra.

May 26, 1905.—A filiform passed easily to-day and the urethra is dilated up to 22 F.

June 6, 1905.—The patient was dilated several times with filiforms and followers. The Kollmann dilator passed with ease and can be dilated up to 27 F.

Cystoscopic examination.—A catheter passes with ease and finds only 20 cc. residual urine. The cystoscope shows no prostatic enlargement. The diverticula are still present. The patient voids urine in a full stream, has no incontinence, partial erections have occurred.

November 30, 1905.—Letter. The wound has remained closed. I have had no dilatation or other treatment. I void urine naturally, four times during the day and twice at night, sometimes one pint at a time. Erections have returned and intercourse is entirely satisfactory. My general health is good and I consider myself cured.

May 9, 1906.—Letter. I void urine normally at natural intervals and in normal quantities. I suffer no pain. I have erections and satisfactory intercourse. My general health is fine and I have gained in weight, and I consider myself cured.

Pathological report.—The specimen, G. U. 149, consists of three lobes of the prostate, and weighs about 12 gm. The right lobe measures 5 x 1.5 x 2 cm., is irregular in shape, and on section shows considerable stroma, and no dilated acini. The left lobe is more regular, measures 5 x 3.5 x 1.5 cm., and on section shows a great deal of stroma and is very fibrous in feel. The median portion is represented by a mass 8 mm. in diameter and seems very fibrous in character. No mucous membrane, no ejaculatory ducts, no calculus removed.

Microscopic examination.—On microscopic examination the hypertrophy in the right lobe is of a fibro-muscular type with a moderate amount of gland acini present. The acini are for the most part arranged in small aggregations, and the lumina are nearly all small. Only occasionally does one see any complexity of the lumina and scarcely any evidence of glandular proliferation is present. There is no evidence of compression due to formation of inflammatory tissue. The stroma is considerably in excess of the gland tissue, and seems to contain slightly more muscle than connective tissue, the muscle and connective tissue interlacing in various ways. In the left lobe the stroma and gland tissue are present in the same proportion as in the right, but the acini in a few areas show more signs of glandular proliferation, and

also have more complexity of their lumina. The stroma is very rich in muscle. There is present a well marked prostatitis, especially marked in the periglandular tissue.

Case 83.—*Considerable enlargement of lateral lobes. Small median bar. Previous suprapubic prostatectomy. Vesical calculi. Old endocarditis. Reacted well. Hiccough, stupor. Hypostatic congestion of lungs. Death 21st day.*

No. 899. W. S. H., age 73, married, admitted April 17, 1905.

Complaint.—" Inability to urinate. Catheterism."

History of probable gonorrhœa at age of 17 years.

Present illness began about 15 years ago with frequency and difficulty of urination. During the next three years there was a gradual increase in difficulty and frequency, and then complete retention of urine came on, requiring catheterization. After that urination was very frequent, but the catheter was not used until four years ago, but catheterization was very difficult, and suprapubic prostatectomy was performed by another surgeon. The suprapubic wound healed and micturition was improved, but still frequent for a time, but he soon had to begin the use of the catheter again, and during the past year has led a catheter life.

S. P.—The patient catheterizes himself five or six times in 24 hours. Of late he has had considerable pain in the region of the bladder, but no hematuria. His general health has been bad, and he has lost considerable weight, having lost 20 pounds during the past year.

Sexual powers have been practically absent for several years.

Examination.—The patient is a well nourished old man. Radial arteries are moderately sclerotic. Pulse is regular and of good quality, about 80 to the minute.

Chest.—The lungs are clear throughout, but hyperresonant.

Heart.—The point of maximum impulse is in the fourth interspace about 1 cm. outside of the nipple line. A systolic murmur is present at the apex and transmitted to the axilla. There is a systolic murmur in the pulmonic area and the second pulmonic and second aortic are ringing in character.

Abdomen.—Three herniæ are present. A small ventral in the region of the suprapubic scar, a small incomplete right inguinal and a very large complete left inguinal. Kidneys negative.

Rectal.—The prostate is considerably enlarged in both lateral lobes, each of which forms a globular mass about the size of a hen's egg with a deep sulcus and notch between them. The prostate is smooth, symmetrical, elastic, but firm and not nodular. The seminal vesicles are negative. One small shotlike nodule is felt on the left side, but no enlarged gland.

Cystoscope.—A coudé catheter passes with ease, retention of urine is complete. Bladder capacity 370 cc. The cystoscope shows two large intravesical lateral lobes connected without intervening sulci by a median bar of slight degree. There is a deep cleft between the lateral lobes in front. The bladder is moderately trabeculated and considerably inflamed, and contains three small freely movable calculi. The ureters are easily seen

and are apparently normal. With finger in rectum and cystoscope in urethra the median portion of the prostate is found only moderately enlarged.

Urinalysis.—Very cloudy, acid, 1012, albumin in small amount, no sugar. Urea 10.5 gm. to the liter. Microscopically, pus cells and numerous bacteria.

Preliminary treatment.—Regular catheterization, urotropin and water in abundance. The patient was evidently a poor surgical risk, but owing to the pain and the frequent necessity of catheterization and the calculi, operation was thought advisable.

Operation, April 24, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were each enucleated easily in one piece and measured each about 2 x 2½ x 2 cm. Examination showed very little median enlargement and nothing was removed. In order to remove the calculi the urethra was divided along the left lateral wall, and the three calculi were removed, the largest measuring 1 x 1½ cm. in size. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. Infusion and continuous irrigation on return to the ward. The patient stood the operation well. Pulse at the end 88.

Convalescence.—The patient reacted well from the operation, the pulse varying between 76 and 84 during the next 24 hours. The temperature rose to 100.6°. There was practically no post-operative hemorrhage and very little vomiting.

April 25, 1905.—Highest temperature 100.6°, pulse 88 to 108. Respirations 20 to 24. Continuous irrigation discontinued, gauze removed, small amount of bleeding.

April 26, 1905.—Highest temperature 100°, pulse 80 to 104, respirations 20 to 24. Fairly comfortable, soft diet, water in abundance, tubes removed.

April 27, 1905.—Temperature 99°, pulse 88, respirations 20. Light diet and water in abundance. Complains of pain in wound.

April 28, 1905.—Temperature 100.2°, pulse 96, respirations 24. Light diet, water in abundance. Urine secreted in large amount, Patient complains of pain in wound and discomfort in abdomen.

April 29, 1905.—Highest temperature 101.2°, pulse 96, respirations 20. The patient is drowsy, weak and listless, has very little appetite.

April 30, 1905.—Highest temperature 100.6°, pulse 88 to 104, respirations 20 to 24. Drowsy, very little appetite, water 86 ounces by mouth. Infusion of 1000 cc. salt solution.

May 1, 1905.—Patient had a chill followed by a temperature of 101.4°. Weak, drowsy, hiccoughing. Water 28 ounces by mouth, infusion 1000 cc. salt solution.

May 2, 1905.—Highest temperature 99.6°, condition improved, up in a chair. Hiccough at intervals, soft diet, water 30 ounces by mouth, 200 cc. by rectum.

May 6, 1905.—The patient has had a daily temperature, generally reaching 101°, to-day 99°. He has been weak, at times irrational and hiccoughing intermittently, his respirations have become weak and there is considerable expectoration.

May 10, 1905.—The patient has had a slight temperature, has been irrational at times, complains of considerable pain in the wound. No nausea, vomiting or hiccough for several days. Soft diet and water in abundance. Infusion 1000 cc. salt solution two days ago. Examination of the chest showed many râles, and a condition of hypostatic congestion.

May 12, 1905.—Patient is becoming weaker, at times in a heavy stupor. Respirations labored, coughs considerably, refuses nourishment and water. Temperature 101.6°, respirations 24.

May 13, 1905.—The patient continues to secrete a large amount of urine and the wound looks well. There is still considerable mucus in the throat, the respirations are very labored, the patient is in a drowsy state and cannot be aroused and refuses nourishment. Salt solution per rectum.

May 14, 1905.—The patient grew gradually weaker and more stupid and respirations more shallow and rapid, and he died at 9 p. m. During the last five days the temperature has only reached 102°, and the pulse has not been above 110. There has been no hiccough, nausea or vomiting and death has apparently been due to hypostatic congestion of the lungs. The kidneys continued to secret urine in abundance, and the wound and bladder appeared to do well. No autopsy was allowed.

Pathological report.—The specimen, G. U. 159, consists of the two lateral lobes of the prostate each removed in one piece and weighing in all about 12 gm. They are about equal in size, and measure 2.5 x 2 x 2 cm. Their external surfaces are fairly smooth, except where torn, and on section the surface is fairly homogeneous and there are very few dilated glands. A few pin-point calculi are scattered here and there. One vesical calculus is whole, and measures 1.5 x 1 x .8 cm., and is shaped like a beet. The other calculus is about the same size, but has been broken into several pieces. The outer surfaces are smooth, white and finely granular. The broken surfaces are yellowish and coarsely granular.

Microscopic examination.—The hypertrophy is a glandular one with the arrangement of the acini in lobules. The acini are only moderately dilated, and their lining epithelium shows considerable degeneration and desquamation. In the periphery of the lobule there is the usual condensation of tissue with flattening and elongation of the acini. The stroma is largely composed of fairly dense connective tissue, and contains a rather small amount of muscle. The arteries show but slight thickening.

Case 84.—*Moderate enlargement of median and lateral lobes. Induration. Pain, irritability. Cure.*

No. 943. M. L. L., age 72, married, admitted April 13, 1905.

Complaint.—" Enlargement of the prostate. Frequency of urination."

No history of gonorrhœa.

Present illness began about 20 years ago, since which time he has had more or less difficulty in urination. About this time he had hematuria and pain in the back and diagnosis of congestion of the kidneys was made. He began to get up at night to urinate five years ago, and since then difficulty and frequency have gotten gradually worse.

S. P.—He now voids seven times during the night, and about every hour during the day. For the past month he has had severe pain in the bladder during urination, and occasionally there is considerable dribbling. He has no pain in the back, perineum or thighs. His sexual powers are very poor. Erections few and imperfect.

Examination.—The patient is a fairly well nourished man. Chest and abdomen are negative.

Rectal examination.—The prostate is moderately hypertrophied. The left lateral lobe is larger than the right which is small and contains about the middle of its outer surface a small, round, hard nodule about the size of a pea. The rest of the prostate is soft and there is no induration in the region of the seminal vesicles, no enlarged glands. The urine is very cloudy and contains a large amount of pus and cocci, considerable albumin, no sugar, sp. gr. 1017. Urea 12 gm. to the liter.

Cystoscopic examination.—A small coudé silk catheter passes with ease and finds 250 cc. residual urine. The bladder is very irritable, rebelling at 200 cc. Examination of the prostatic orifice shows an unusually irregular outline. The upper portions of the lateral lobes project quite far into the bladder, terminating in sharp points. The median lobe is small and separated from lateral lobes by deep sulci. The mucous membrane covering the prostate is smooth, and there is nothing to suggest malignancy. The bladder wall is considerably trabeculated, the ureteral ridges are prominent and their orifices negative. A careful search failed to reveal any calculus. With the finger in the rectum and cystoscope in the urethra the amount of tissue between the two is slight.

Preliminary treatment.—Catheterization twice daily, irrigation. Urotropin by mouth. Under this treatment the patient has been much more comfortable.

Operation, April 25, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes which were of moderate size were enucleated with ease, and the median lobe which was small was extracted through one of the lateral cavities. The ejaculatory ducts were preserved. The wound was closed as usual with double tube drainage for the bladder, and light gauze packing for the lateral cavities. The patient stood the operation well. Infusion and intravesical irrigation. Pulse at end of operation 85.

Convalescence.—The patient reacted well. The highest temperature was on the day following the operation, 100.4°. It remained normal after the third day. Continuous irrigation was kept up for 12 hours when the gauze packing was removed. The tubes were removed on the second day. The patient was up in a chair on the third day. Interval urination was established immediately after removal of the tubes, urine coming through the penis on the fourth day and the perineal fistula closing on the 14th day. The patient walked about considerably after the first week, and was discharged on the 25th day, when the following note was made: The wound is closed, the patient voids urine every four hours, in a good stream, has no pain nor dribbling. He has already had several imperfect erections.

His condition is excellent. A silver catheter passes with ease, no stricture, no residual urine.

November 30, 1905.—Letter. I can void urine naturally, have had no instrumentation, urinate five or six times during the day and three or four during the night. The amount voided is usually small, never as much as half a pint, but the bladder is irritable. Erections are present but imperfect, and sexual intercourse is unsatisfactory, but was so before the operation. My general health is excellent. When I void urine the stream is large and free enough at the beginning, then it becomes small and sometimes in driblets.

January 27, 1906.—Letter. I void urine twice during the night and six times during the day. I void urine freely in a large stream unless I try to hold it too long. When the desire to urinate comes on I must attend to it at once, else there may be an escape of a small amount of urine. I have no other incontinence. I have no pain or irritation.

May 5, 1906.—Letter. I void urine naturally and have not used a catheter. If I do not respond to the call promptly there is a slight escape of urine, but I have no definite incontinence. I retire at 10.30 and arise about 4 o'clock to urinate and again at 5.30 when I get up. The amount voided is never as much as half a pint. I suffer no pain. I have imperfect erections, no worse than before operation. My general health is excellent and I have gained in weight. No one can dispute the wonderful success of the operation and the unspeakable relief.

Pathological report.—The specimen, G. U. 152, consists of the three lobes of the prostate, each removed in one piece and weighing in all 5½ gm. The lateral lobes are each about 2 cm. in diameter. Their surfaces are irregular, and on section considerable stroma and very little gland tissue is evident. No dilated glands are seen. The median lobe is very small, measuring 1.5 x 1 x .8 cm. and presents the same characteristics as the lateral lobes.

Microscopic examination.—The hypertrophy is only a moderately glandular one, there being present a large amount of stroma. Within the moderately glandular lobules the acini seem rather compressed and elongated. The epithelium lining the acini presents a great deal of degeneration, while the stroma seems to be undergoing a marked fibrous hyperplasia. The arteries show quite a marked thickening.

Case 85.—*Slight median and lateral hypertrophy. Vesical calculus. Cure. Followed 13 months.*

No. 929. A. S., age 64, married, admitted April 7, 1905.

Complaint.—"Enlarged prostate."

No history of gonorrhœa.

Present illness began with a sudden attack of intense pain along the urethra four and one-half years ago. About the same time both testicles became swollen and painful. Since then patient has been troubled with frequent micturition with pain during and occasionally at the end of urination, and of late slight hematuria. Has recently passed several small

calculi. There has never been complete retention of urine, but he has catheterized himself occasionally on advice of his physician.

S. P.—Urination every hour night and day with considerable difficulty, pain in urethra and occasionally slight hemorrhage.

Sexual powers.—There has been a marked decrease in his sexual power, but erections still occur occasionally. His general health has remained good.

Examination.—Fairly well nourished man with lips of good color. Chest, abdomen, negative.

Genitalia.—The left epididymis is indurated.

Rectal.—The left lobe of the prostate is about normal in size, smooth, fairly soft except at the upper end where it is slightly indurated and adherent to the seminal vesicle. The right lobe is about twice as large as the left, is prominent, indurated but compressible and not of stony hardness. Its contour is slightly irregular, and at its upper end is an oblong, smooth oval mass markedly indurated, projecting into the region of the right seminal vesicle for a distance of about 1.5 cm. The seminal vesicle above is not indurated, and there is no mass extending outward toward the pelvis, no periprostatic induration, no intravesicular mass, no enlarged glands. The rectal mucosa is soft and not adherent.

Cystoscopic.—A small coudé catheter passes with ease and finds 50 cc. residual urine. The bladder is small and irritable. The lateral lobes are apparently not at all intravesically enlarged and there are no clefts between them in front. There is a small but definite median enlargement in the shape of a rounded bar, but there are no clefts on either side. The mucous membrane is smooth. A fairly large roughly granular, white calculus, freely movable in the bladder is seen. The bladder is moderately trabeculated, chronically inflamed. There are no diverticula present.

Urinalysis.—Cloudy, alkaline, no sugar, albumin in small amounts. Microscopically pus and epithelial cells, cocci, and bacilli. Urea G-12 to liter. Total urine 1600 cc.

The patient developed pleurisy soon after admission and operation was delayed on that account.

Operation, April 25, 1905.—Ether. Perineal prostatectomy by the usual technique. Extraction of a moderately large calculus through the wound. The lateral lobes were only slightly enlarged and were quite adherent, but each was removed in one piece. A small median lobe about 2 cm. in diameter was removed through one of the lateral cavities without tearing away any of the mucous membrane. The urethra was then incised along lateral wall to the neck of the bladder, and the calculus removed. The wound was closed as usual with double tube drainage and lateral gauze packs. The levators were drawn together with catgut.

The patient stood the operation well, pulse at the end being 80. Infusion and continuous irrigation on return to room. The patient reacted well. His temperature rose to 101.2° on the day after the operation, but fell promptly and remained normal afterwards. The irrigation was discontinued after 12 hours, the tubes were removed within 24 hours and the

gauze within 48 hours. He was up in a chair on the third day and urine passed through the urethra on the fourth day. The perineal fistula closed finally on the tenth day, and at that time he was able to retain urine for five hours. He was discharged on the 15th day, voiding at intervals of about three hours with perfect control, size and force of stream good. A silver catheter passed with ease and found no residual urine. There were no complications.

November 30, 1905.—Letter. The wound has remained closed. I void urine two or three times during the night and six to nine times during the day. I suffer a slight pain at the end of urination, and if I procrastinate too long between urinations I have pain in the bladder. The urinary stream is full and free, but I do not void more than three and one-half ounces at a time. I have erections, but imperfect. My general health is good and I have gained 20 pounds. The urine is straw color and there is no sediment.

May 15, 1906.—Letter. I void urine naturally, but not without some pain, about every two and one-half hours during the day and once at night. I sometimes pass a little over a half a pint at a time. I suffer no pain at the end of urination. I have erections and have had intercourse, but it is not very satisfactory. My general health is good, I have gained in weight, I am markedly improved but cannot say that I am cured.

Pathological report.—The specimen, G. U. 151, consists of the three lobes of the prostate each removed in one piece. The weight is about G-13. The median lobe measures 1.6 x 1.5 x 1 cm. in size. The right lobe measures 3 x 1.5 x 1 cm. The left measures 2 x 1.3 x 2 cm. The character of the three lobes is somewhat similar, the surface is irregular, and the cut surface is fairly homogeneous with few acini showing.

Microscopic examination shows a moderately glandular hypertrophy. Lobulated areas rich in gland tissue, alternating with areas in which the acini are rather sparsely distributed, and in which the stroma predominates. In some areas marked glandular proliferation is going on while in others hyperplasia of the stroma with atrophy of the parenchyma is taking place. The stroma contains rather more fibrous tissue than muscle. Some areas of chronic inflammatory infiltration.

Case 86.—*Moderate hypertrophy of median and lateral lobes. Catheterism. Cured. No complications.*

No. 910. T. B., age 61, married, admitted April 25, 1905.

Complaint.—" Difficulty of urination. Intermittent catheterism."

The patient had gonorrhœa at the age of 16, and several times later. Since 1864, has had no urethral discharge, no evidence of stricture, and sexual powers have been normal. Present illness began six years ago with slight difficulty and frequency of urination. After that patient's symptoms gradually increased and two years ago had retention of urine for the first time. During the past 18 months the patient has used the catheter at least once a day, and of late three times a day.

S. P.—Urination is difficult, considerable straining being required. He uses a catheter three times at night, but none in the day. The only pain he has is slight and dull in character and located in the lumbar region. His sexual powers are satisfactory.

Examination.—Patient is a sturdy looking man with mucous membranes of good color and slight arteriosclerosis. Chest and abdomen, notes lost.

Both testicles are very small, but the genitalia are otherwise normal. The prostate is moderately hypertrophied, smooth, rounded, elastic but fairly firm. Slight induration at the base of the left seminal vesicle, but the right is normal. The prostatic secretion is composed almost entirely of pus cells, a few lecithins and large granule cells are present. The urine is acid, slightly cloudy and contains pus and bacilli in great number. A silver catheter passes with ease. 300 cc. residual urine present. The bladder capacity is slightly contracted. The cystoscope shows a fairly large median lobe bilobular in shape. The lateral lobes do not project into the bladder. Considerable trabeculation of the vesical wall and a moderate cystitis is present. The left ureter is secreting normal urine. The right ureter cannot be seen as it lies behind the median lobe of the prostate.

Preliminary treatment.—Regular catheterization, intravesical irrigations and urotropin for three days.

Operation, April 28, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were only moderately enlarged, but quite adherent and were removed with difficulty. The median lobe was removed through the right lateral cavity, a small tear being made in the lateral wall of the urethra, but no mucous membrane being removed. The rest of the urethra and ejaculatory ducts were preserved intact. A finger introduced through the urethra into the bladder showed no enlargement remaining. There was very little hemorrhage and the patient stood the operation well. The wound was closed as usual with double tube drainage for the bladder and continuous irrigation was supplied on the table and after his return to the ward, when a submammary infusion of salt solution was also given. Pulse at end of operation 80.

May 24, 1905.—(26th day.) The patient has had an uninterrupted convalescence. The gauze was removed on the day after the operation and the tubes on the second day. After that there was constant leakage through the perineum for two days, but after that interval urination every two hours was established. The patient was out of bed on the third day. On the fourth day the urine began to pass through the penis, and the fistula finally closed on the 21st day. No epididymitis. The patient now does not arise at night to urinate (a period of eight hours). There is no urgency, no incontinence, no dribbling except a few drops at end of urination. He can hold his urine for five hours during the day, has no pain and "enjoys urinating." The wound was closed, there is no fistula, a catheter meets no obstruction and there is no residual urine present. He has had no instrumentation since operation. The urine is almost clear and contains only a few bacilli. Patient was discharged

from the hospital on the 27th day. The highest temperature was 100.5° on the day after the operation, after that normal.

November 30, 1905.—Letter. I void urine naturally three times during the day and once or twice at night from one-half to three-quarters of a pint at a time. The wound has remained healed and I suffer only a very slight pain occasionally. I have only partial erections and intercourse is not satisfactory, the ejaculation being small in amount. My general health is excellent and I consider myself cured.

May 8, 1906.—Letter. I void urine naturally, four or five times during the day and once or twice at night, about a pint at a time. I suffer no pain. Sexual intercourse is not satisfactory, erections being too weak and the ejaculation very slight. My general health is good, I have gained in weight and consider myself entirely well.

CASE 87.—*Slight hypertrophy. Great frequency. Retention two weeks. Pain. Cure. Followed 19 months.*

No. 909. J. D. B., age 55, married, admitted April 21, 1905.

Complaint.—" Difficulty and frequency of urination and pain."

The patient had gonorrhœa 25 years ago, a severe attack, but not followed by gleet nor stricture. Urethritis a second time seven years ago, severe and followed by difficulty of urination.

The present illness began with frequency and difficulty of urination during the attack of gonorrhœa seven years ago. Since then there has been a gradual increase in these symptoms, but at times they are worse than at others. Intermittent attacks of irritation with marked frequency of urination, often 10 to 12 times every night have occurred. At other times he can retain urine for three or four hours. Complete retention of urine came on for the first time in January, 1905, and the catheter was necessary for two weeks. Since then he has used the catheter once a day. For one year patient has had pain in the left lumbar region, intermittent, dull and lasting only for a short time. Occasionally this pain would radiate to the left groin and testicle, but it was never of a severe colicky character.

S. P.—The patient voids urine about 12 times during the night, and every 15 to 30 minutes during the day. When the desire to urinate comes on there is a pain in the neck of the bladder and an urgency of urination. There is no pain in the urethra nor any hematuria. No pain in the rectum or thighs. The stream of urine is small, difficult to start and followed by dribbling. He has not lost weight. Erections are present; coitus causes pain.

Examination.—Patient is a healthy looking man. Chest and abdomen negative.

Rectal examination.—The lateral lobes of the prostate are moderately hypertrophied, smooth, soft. The seminal vesicles are not indurated and no enlarged glands are felt. The urine is slightly cloudy, acid, and contains numerous pus and epithelial cells and bacilli. A catheter passes easily and finds only 60 cc. residual urine. The bladder is contracted, holding only 300 cc.

The cystoscopic examination is unsatisfactory owing to hemorrhage. The bladder wall was seen to be considerably trabeculated. No stone was present. The median portion of the prostate was slightly enlarged. With the finger in the rectum and cystoscope in the urethra the beak could be easily felt, but there is considerable increase in the median portion of the prostate.

Operation, April 29, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were not greatly enlarged, but adherent in their deeper portions. The median lobe was so small that it could not be engaged with the tractor. The finger was then inserted and a median lobe about 1 cm. in diameter drawn into the left lateral cavity and enucleated. The right lateral wall, floor of the urethra, and ejaculatory ducts were preserved intact. A small tear was made in the left lateral wall in removing the middle lobe. There was considerable hemorrhage but the patient stood the operation well. Double tube drainage and closure as usual. Saline infusion and continuous irrigation on return to the ward.

Convalescence.—The patient reacted well from the operation. The tubes were removed on the second day and the gauze on the third day. The urine began to flow from the urethra on the sixth day and the fistula healed on the 13th. Patient was up in a wheel chair on the third day and has been walking since the fourth day. Temperature rose to 101°, but was normal after the third day.

May 18, 1905.—(20th day.) There has been no epididymitis nor other complications. He has perfect control and there is no dribbling. The wound is healed. A silver catheter passes with ease, no stricture encountered and no residual urine. The urine is almost clear, contains only a few pus cells and no bacteria. The patient is discharged from the hospital.

November 30, 1905.—Letter. I void urine naturally six or eight times during the day and two to four times at night, about one-half pint at a time. The perineal wound has remained closed, I suffer no pain. Have partial erections, but intercourse is not satisfactory. My general health is excellent and I consider myself cured.

May 28, 1906.—Letter. I have not had to use a catheter and void urine naturally about eight times during the day and two to four times at night and as much as half a pint at a time. I have no pain. Erections and sexual intercourse is improving, but is not as yet entirely satisfactory. I have had no complications nor treatment. My general health is very good, and I consider myself cured.

Pathological report.—The specimen, G. U. 157, consists of three lobes of the prostate removed each in one piece, and weighs probably not more than G-10. The median lobe measures 1.5 x .8 x .5. The right lobe measures 3 x 1 x 1.5 cm. and the left 2.5 x 2.5 x 1.3 cm. No mucous membrane, no ejaculatory ducts, no calculi.

Microscopic examination.—Microscopically the gland tissue is distributed with slight tendency to lobulation. In areas the acini are fairly numerous while in other areas the stroma predominates.

In the glandular areas the acini are small with a rather dense fibro-muscular frame work, and considerable endoglandular proliferation. The acini are rather closely set together and display but very little of the complexity so evident in some of the glandular hypertrophies. The stroma in these glandular areas is largely composed of fibrous tissue with here and there some periacinous and interstitial inflammatory infiltration. In the portions containing more stroma than gland tissue the alveoli are for the most part plugged with masses of proliferating and degenerating epithelial cells, and there is considerable excess of fibrous tissue over muscle in the stroma. Here and there are areas of interstitial infiltration, and some periacinous connective tissue formation.

In this prostatic tissue the gland and stroma are present in about equal proportions; the relative amount of each varying in different areas, while the alveoli are small rather closely aggregated and with a rather dense interlacing stroma. No evidence of malignancy. The entire picture is simply one of prostatitis.

Case 88.—*Moderate hypertrophy of median and lateral lobes. Catheter life. Cured. Followed 13 months.*

No. 911. G. F., age 72, widowed, admitted April 26, 1905.

Complaint.—" Complete retention of urine, catheterism."

There is no history of gonorrhœa.

Present illness began about 15 years ago with frequency and slight difficulty of urination. This gradually increased, but he did not have to be catheterized until three years ago, but chronic retention of urine has only been present for the past year and he now catheterizes himself every five hours and is unable to void naturally. He suffers no pain, has not lost weight. Occasionally has erections, but no desire, and has not had intercourse for about 10 years.

Examination.—The patient is a sturdy looking man for his age.

Rectal examination.—The prostate is considerably enlarged, globular in shape and about the size of an orange. The surface is smooth and regular, with the exception of the anterior portion of the right lateral lobe where a small lobule is felt. The consistence is firm, and there is distinct induration at the base of the right seminal vesicle. The prostatic secretion contains many pus cells, few granule cells and lecithins. The urine is cloudy, and no sugar, no albumin. Microscopically pus cells and bacteria, no casts. Urea, 27 gr. to the liter.

Cystoscopic examination.—The patient is unable to void urine. A coudé catheter enters with ease and finds a bladder capacity of 350 cc. The cystoscope shows hypertrophy of both lateral lobes, and a small round enlargement of the median lobe. There is a deep sulcus between the lateral lobes in front. The bladder is trabeculated. There is no stone present. The left ureter can be seen but the right cannot.

Operation, April 29, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were moderately enlarged. The median

lobe measured 2 x 2 x 3 cm. in size, and was easily enucleated through the right lateral cavity, but in so doing a tear was made in the urethra. After removal of the tractor a finger was inserted and found that all hypertrophied tissue had been removed. The lateral cavities were packed with gauze. Double catheter drainage was supplied and the wound was closed as usual. Saline infusion and continuous irrigation given on return to ward. There was very little hemorrhage and patient's condition at the end was good.

Convalescence.—Gauze and catheters were removed 48 hours after the operation and the patient was at once gotten out of bed. The next day he began to walk. The fistula closed on the 16th day.

May 18, 1905.—(20th day.) The fistula is closed and urine passes freely and in a large stream through the urethra. The patient can hold his urine for two hours. There is no incontinence, but a few drops dribble away at the end of urination. He has had no instrumentation and no complications. A silver catheter passes without obstruction through the membranous urethra, but it would not pass into the bladder owing to dilated pouch-like condition of the prostatic urethra in which it was impossible to find the prostatic orifice. The patient was discharged with instructions to take urotropin and to hold urine as long as possible in order to dilate bladder.

November 30, 1905.—Letter. I void urine naturally and consider myself cured. The catheter has not been used since the operation. There is no fistula. I void urine once during the night and about three times during the day, 250 cc. at a time. I have no pain. Erections have returned and coitus would be possible if I were so inclined. I have had no complications and my general health is excellent.

May 20, 1906.—Letter. I urinate naturally, four or five times during the day and once at night and about three-quarters of a pint at a time. I have no pain. Erections have returned, but I do not attempt intercourse. My general health is very good, and I consider myself entirely cured.

Pathological report. The specimen, G. U. 156, consists of three pieces of tissue representing the three lobes. The lateral lobes are soft in consistency, lobulated, and weigh about 10 gr. The median portion is a small irregular mass distinctly firmer than either of the lateral lobes. A few small spheroids are present. The ejaculatory ducts have not been removed. No calculus is present.

Microscopic examination.—The hypertrophy is a moderately glandular one with arrangement in lobules. The acini are moderately dilated and in some areas show considerable cystic degeneration. There is present everywhere quite a marked prostatitis, and many of the acini are filled with desquamated epithelial cells and some leucocytes. There is present in the stroma considerable round and polynuclear infiltration with the formation of some inflammatory tissue. The stroma contains a moderate amount of muscle, although there is more connective tissue than muscle present. The arteries show in areas a moderate degree of thickening.

Case 89.—*Severe stricture of urethra, vesical ulcer, slight enlargement of prostate. Urethrotomy, prostatectomy, curettage of ulcer. Death eighth day. Hemorrhage.*

No. 685. H. C. B., age 53, married, admitted August 1, 1904.

Complaint.—"Frequent and difficult urination."

From his 16th to his 35th year patient had gonorrhœa pretty constantly. Since then he has been free from the disease. In 1869, while under treatment for gonorrhœa he had difficulty in urination and an examination revealed two strictures which were treated by dilatation. After that the patient received no treatment for 10 years when the stricture had again closed down so that a filiform was passed with difficulty. After that he was treated by dilatation and electrolysis. At the end of two years his condition was fairly good, but soon the trouble recurred. In 1883, a perineal urethrotomy was performed and "the bladder which was found to be encrusted was curetted.". A little later he began to use a catheter and his condition gradually became worse until 1899, when an internal urethrotomy was performed, followed by dilatation to a 21 American sound. The treatment could not be continued, however, on account of the weak condition of the patient, and micturifion became so frequent that he had to wear a rubber urinal and suffered very greatly from pain. He has never passed gravel.

S. P.—Urine dribbles constantly into the rubber urinal. During the night he urinates as often as every 10 minutes. His conditon has become decidedly worse during the past year and he has suffered great pain.

Examination.—The patient looks sick and weak. The mucous membrane is pale. He is very much concerned about himself, nervous and restless. The heart sounds are diminished in intensity. The lungs and abdomen are negative.

Urethral.—A number 18 F. sound passes with difficulty through a very firm stricture of the deep urethra beginning in the posterior portion of the bulbous region. A small catheter is then passed and 50 cc. residual urine found. The bladder capacity is 100 cc. and this amount causes great pain.

Rectal.—The prostate is only slightly enlarged. The contour is normal in shape, the consistence is slightly indurated. The seminal vesicles are palpable and indurated, but only moderately so. The bladder above feels very hard.

Preliminary treatment.—Prostatic massage, urethral dilatation, vesical dilatation by hydraulic pressure. The stricture was very resistant and after 17 days treatment a filiform was necessary. The bladder was very irritable and dilatation difficult. Prostatic massage was followed by considerable relief of the pain and tenderness in this region and his condition improved, but urination was very frequent especially during the night. Patient discharged.

Second admission, April 17, 1905.—The patient returns for further treatment. He still voids urine with difficulty and pain at very frequent intervals. A hard stricture of the deep urethra is still present, but it is

impossible to pass small sounds without filiforms. The prostate is very little enlarged, moderately indurated, especially at the upper end. The seminal vesicles are palpable and slightly indurated and the bladder very hard.

Urine.—Cloudy, alkaline, 1026, no sugar, albumin abundant. Microscopically pus, bacilli, and cocci.

Cystoscopic examination.—A small silver catheter passes with difficulty into the bladder, considerable force being necessary to push it through the induration along the membranous and prostatic urethra. 100 cc. residual urine is found present. The bladder is very irritable and it is difficult to introduce 100 cc. of fluid. It is very difficult to wash the bladder clean of pus and mucous. The cystoscope shows an irregular prostatic orifice covered by very red granular redundant mucous membrane. The lateral lobes are little if at all enlarged and there is only a slight increase in the median portion. The entire trigone and a portion of the adjacent lateral walls of the bladder are covered by a thin, white, shaggy exudate which cannot be dislodged so that it is impossible to see the conditions of the tissues beneath it. It appears to cover the right ureteral orifice, but the left ureter opened just at the edge of the exudate, the posterior limits of which are sharply defined and contrasted with fairly healthy mucous membrane of the posterior surface of the bladder. There was no intravesical tumor formation. The picture presented in the trigone suggests a malignant ulcer, but as it was impossible to see the base of it no positive diagnosis can be made. With finger in rectum and cystoscope in urethra the beak can be felt, but there is an increase in the thickness of the base of the bladder. The median portion of the prostate is also slightly thicker than normal. The cystoscope is tightly grasped by the urethra and prostate, so that it is difficult to manipulate.

Treatment.—Another attempt was made to relieve patient by urethral dilatation, prostatic massage and hydraulic vesical dilatation, but with practically no success. The patient's condition was very weak, he suffered a great deal of pain in the bladder and urethra, was constantly depressed and slept very little. Micturition was extremely frequent and difficult. Perineal prostatectomy was advised and reluctantly accepted by the patient, who said that he felt convinced that he was going to die.

Operation, May 3, 1905.—Ether. Perineal prostatectomy by the usual technique. Extensive perineal urethrotomy for stricture of urethra, vigorous curettage of vesical ulcer. The prostate itself was compartively small, very fibrous, but adherent to its surrounding capsule. The bulb of the urethra was very fibrous and the membranous urethra behind it surrounded by much irregular fibrous tissue. The membranous urethra was then opened upon a grooved sound and examination showed that the prostatic urethra was dilated and contained several valve-like folds and false passages, two of which were large enough to admit a good sized sound and apparently entered the substance of the prostate. The lateral lobes, which were very small and fibrous were excised with scissors, and the median

portion was removed in the same way. Considerable amount of the dilated prostatic urethra was excised. The bladder was then thoroughly curetted in the region in which the ulcer had been seen. Attention was then turned to the strictured urethra, the walls of which were found to be greatly increased and very fibrous, and on account of induration of the anterior portion of the bulbous urethra internal urethrotomy was performed from the wound with a blunt pointed bistoury. One catheter was placed in the urethra and the other placed in the perineal wound in the bladder. The lateral cavities and the urethrotomy wound were packed with gauze and the skin wound partially closed with catgut. Patient stood the operation well, pulse at the end being 110. Infusion and continuous irrigation after return to ward.

Convalescence.—The highest temperature was on the day after the operation 100.6°. The pulse was never good, reaching 120 during the first three days after the operation and 140 on the fourth day. The continuous irrigation was discontinued after 12 hours, the gauze was removed at the end of 30 hours and was followed by a slight hemorrhage which led to repacking of the wound. The catheter in the penile urethra drained well.

May 7, 1905.—The patient has been weak, nauseated and vomited several times. To-day his temperature dropped and could not be registered. There was an immense blood clot in the perineal wound which was dislodged by the patient's straining to urinate, and this was followed by considerable bleeding. The urethra, bladder, and wound were irrigated and packed. The pulse is irregular, 140 to the minute.

May 8, 1905.—Pulse 120, temperature 100°, patient much more comfortable. The dressings are soaked with urine and only slightly tinged with blood. Some urine passes through the penis. The patient is very nervous and concerned about himself. P. M. There has been considerable bleeding in the perineal wound this afternoon.

May 9, 1905.—The pulse is 120, the temperature normal. There has been less bleeding but the patient has had two or three attacks of intense pain in the bladder followed by passage of clots through penis and perineal wound.

May 11, 1905.—Yesterday the patient was generally weaker, felt cold, was nervous and restless. Temperature 96. The dressings were soaked with urine which was tinged with blood. Strichnine was administered. During the afternoon he had two rather profuse hemorrhages from the perineal wound, and he was infused. Packing the perineal wound did not control the hemorrhage. At midnight the patient was catheterized, and suprapubic cystotomy performed. A large blood clot was found in the bladder which was packed with gauze. A clot of blood was evacuated from the perineal wound which was also firmly packed. The patient was transfused on the table and seemed to stand the operation well, but shortly afterward his pulse became weak and irregular and his respiration shallow. At 7 a. m. to-day he was restless and in a stupor and the pads were soaked with urine. There has been no fresh hemorrhage. His hands and feet were cold and cynosed. Pulse was irregular, weak, 116. After

that the pulse and respiration gradually grew worse, did not respond to stimulants or infusions and the patient died at eleven o'clock. A vigorous attempt was made to get an autopsy, but without success.

Pathological report.—The specimen, G. U. 154, consists of the three lobes of the prostate removed in one piece and weighs G-7. The right lobe weighs G-3.5, measures 2.5 x 2 x 1.5 cm., is fairly smooth, oval, and on section shows considerable stroma and a small amount of gland tissue. The left lobe weighs G-3, and measures 2.5 x 2 x 1.5 cm.; it is very irregular and considerably torn and on section is similar to the right. The median lobe is a small mass, weighing G-.5 and measuring 1.5 x 1.3 x .5 cm. No mucus membrane, no ducts, no calculi. The scrapings from the vesical ulcer have been lost.

Microscopic examination.—Microscopically the sections contain very few glandular alveoli. About nearly all of the ducts there is a polynuclear and round cell infiltration with formation of new connective tissue and within many areas compression of the glands. The infiltration is, for the most part, periacinous, and within the lumina of the ducts there is endoglandular proliferation and degeneration of the epithelial cells. A few leucocytes are seen in the culs-de-sac. The stroma, as was said above, is greatly in excess of the gland tissue, is quite dense and compact, and seems for the most part fibrous tissue although there is present a fair amount of smooth muscle. It is distinctly a fibro-muscular prostate with predominance of the fibrous tissue, and diminution in the gland elements, and the whole picture is that of prostatitis rather than prostatic hypertrophy.

Case 90.—*Small rounded median lobes. Contracted bladder. Occasional complete retention. Cure.*

No. 916. E. P. E., age 50, married, admitted April 29, 1905.

Complaint.—" Bladder trouble."

No history of gonorrhœa.

Present illness began 10 years ago with an attack of burning in the urethra and frequency of urination. During the next three years had similar attacks at intervals of two to four weeks. About seven years ago began to have slight difficulty of urination, and one year later complete retention of urine requiring catheterization. Since then has had to catheterize himself on numerous occasions, but as a rule has voided naturally, but very frequently. Has had no hematuria nor severe pain.

S. P.—The patient urinates every two hours and from two to four times at night. Occasionally he is unable to void and has to pass a catheter, usually finding about five ounces of urine. Occasionally there is a slight pain in the urethra extending to the end of the penis, and a spasm in the bladder at the end of urination. He has never passed a calculus and has had no pain in rectum, perineum, or thighs.

Sexual powers.—Present.

Examination.—The patient is a well nourished man with lips and mucous membranes of good color. Chest and abdomen are negative.

Rectal.—The prostate is only slightly hypertrophied. The right lobe being a little larger and more prominent than the left. It is soft and smooth. The seminal vesicles are negative.

Cystoscopic.—A catheter enters with ease and finds only 15 cc. residual urine. The bladder capacity on forced distention is only 225 cc., the patient complaining of pain before that amount is injected. The cystoscope shows a small rounded median lobe with a deep sulcus on each side. The lateral lobes are not enlarged and there are no clefts between them in front. The bladder is very little trabeculated, there is no inflammation and the ureters appear normal. With finger in rectum and cystoscope in urethra very little enlargement is to be felt (the cystoscope evidently in one of the clefts).

NOTE.—The absence of residual urine, cystitis and vesical trabeculation would seem at first sight to show that an operation was unnecessary. The frequency and difficult of urination and occasional attacks of retention of urine, however, made patient demand an operation.

Urinalysis.—Cloudy, 1014, acid, no sugar, a trace of albumin, microscopically pus cells and bacilli. Urea, G-16 to liter.

Operation, May 3, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were easily enucleated, the left being small, the right moderately hypertrophied. The median lobe was drawn into the right lateral cavity by means of the tractor and easily enucleated. The urethra and ejaculatory ducts were preserved. The wound was closed as usual with double drainage tubes and light packs for the lateral cavites. The patient stood the operation well, the pulse at the end being 100. No infusion, no irrigation.

Convalescence.—The highest rise of temperature was on the evening after the operation 99.7°, after that the patient's temperature was practically normal. There was considerable blood in the urine for the first 30 hours, and when the gauze was removed at the end of 24 hours there was considerable hemorrhage so that the wound was repacked. During the next four days, the patient complained of severe pain in the urethra which was relieved by urethral irrigation. On the fourth day urine came through the penis, the tubes having been removed on the second day. On the sixth day the patient was able to retain urine for three or four hours. The perineal fistula closed on the 15th day. Three weeks after the operation there was very slight pain and tenderness in the left epididymis which subsided in 24 hours after application of ice. On discharge from hospital on the 28th day the patient was able to hold urine for five hours, stream was large, there was no incontinence, the wound was closed, a silver catheter showed no obstruction and found no residual urine.

November 30, 1905.—Letter. I void urine naturally four or five times during the day, usually not at all during the night, often one-half pint at a time. The wound is healed and I consider myself cured. Erections are satisfactory, and intercourse normal. My general health is good.

May 9, 1906.—Letter. I void urine naturally every four or five hours

during the day and none at night, about half a pint or more at a time. I have no pain. Erections and intercourse are satisfactory. My general health is good, and I consider myself cured.

Pathological report.—The specimen, G. U. 153, consists of the three lobes of the prostate and weighs G-7.5. The right lobe 2.5 x 2 x 1.2 cm. weighs G-3.5. The left 2.5 x 2 x 1 cm. weighs G-3.5. The median 1 x 1 x .6 cm. in size, weighs G-.5. The surface of the lobes is irregular, in places torn, the consistence is firm and the section shows very little spheroid formation and few dilated ducts. The consistence is homogeneous.

Microscopic examination.—The hypertrophy is a moderately glandular one. The acini are only slightly dilated although occasionally one sees acini of considerable size with numerous intraacinous off-shoots. The acini contain numerous corpora amylacea and are lined by epithelium which is usually two layers in thickness. The stroma is rather dense, and contains an unusually large amount of muscle which is irregularly intermixed with the connective tissue. The arteries show practically no thickening. No prostatitis was noted in the sections.

Case 91.—*Moderate enlargement of median and lateral lobes. Catheter life. Attack of hemiplegia previously. Cure. Followed 12 months.*

No. 934. C. E R, age 66, married, admitted May 13, 1905.

Complaint—" Enlarged prostate."

Had gonorrhœa when a young man.

Present illness began about nine years ago with a slight frequency of urination. He did not have to get up at night, had no straining, and at intervals was entirely comfortable. These periods of increased frequency gradually grew worse until four years ago he began to have pain and one day a severe hemorrhage into the bladder followed by complete retention of urine. After that slight hemorrhage occurred at intervals, but he did not have to use a catheter until 18 months ago, since which time he has used it every day, at first only at bed time. In February, 1903, hemiphlegia of the left side came on, but he subsequently made a complete recovery. During the past two months the patient has had to use the catheter from three to five times a day. Last month, while in Italy, catheterization became much more difficult and painful, and he went at once to London to see a surgeon, who advised an immediate suprapubic prostatectomy. His son who is a physician cabled him to wait and went over and brought him to Baltimore.

S. P.—Patient catheterized himself every four hours, and on account of a dull pain takes one-fourth to one-half of a grain of morphia daily. Retention of urine is practically complete.

Sexual powers.—Are still satisfactory.

Examination.—Patient is a weak looking man of sallow complexion, but lips are of good color. The pulse is regular and of good volume. Very little arteriosclerosis is present. Chest and abdomen are negative.

Rectal examination.—Prostate is moderately enlarged, bulges slightly towards the rectum, contour is rounded, surface smooth, consistence is

elastic, with a little induration at the upper end of the right lobe which does not extend into the region of the seminal vesicles, both of which are soft. No indurated lymphatics or glands are to be felt, and the prostate is not tender. Prostatic secretion is composed largely of pus cells. Some large granule cells are present, but no spermatozoa.

Cystoscopic examination.—A catheter passed with ease. Complete retention of urine is present. The vesical capacity is large. The cystoscope shows a fairly large median lobe with a deep sulcus to the left of it. The lateral lobes are only slightly hypertrophied intravesically. The bladder is markedly trabeculated with numerous pouches and one diverticula. In the trigone in front of the interureteral bar is a succession of bullæ covered with smooth mucous membrane and in places almost papillary in character. At first sight they suggest neoplastic growth, but on further study they are shown to be similar in appearance to the picture obtained in bullous cystitis. With finger in rectum and cystoscope in urethra the beak can be felt, showing no induration in the region of the trigone, and a considerable increase in the median portion of the prostate.

Urinalysis.—Total quantity in 24 hours 1100 cc. Urea 15 gm. to liter. Urine acid, sp. gr. 1016, no sugar, albumin in slight amount, pus cells and bacilli.

Preliminary treatment.—Patient was catheterized regularly, given water in great abundance and urotropin for four days. The blood pressure was taken on the day before the operation and registered 165. Owing to the fact that he had had one apoplectic stroke he was put upon sodium nitrite to reduce the blood pressure.

Operation, May 17, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were moderately enlarged and easily enucleated. The middle lobe was removed partly with the left lateral and partly through the right lateral cavity after removal of the left lateral lobe. The urethra was torn on both sides, but the floor and ejaculatory ducts were preserved intact. After removal of the tractor a finger was inserted into the bladder and showed that the enlargements had been completely removed. The blood pressure was taken before ether was administered and registered 175. Under ether it rapidly rose to 200, and when the patient was put in the lithotomy position with the hips elevated and the thighs flexed the blood pressure rose to 220. In order to reduce the blood pressure no vessels were ligated and fairly free hemorrhage continued, during the operation, but the blood pressure remained between 200 and 225 all through the operation which lasted 18 minutes. As soon as the patient was removed from the table the blood pressure fell to 170. The patient showed no evil effects from the high blood pressure and stood the operation well. The wound was closed as usual with double rubber tube drainage for the bladder, light gauze packs for the lateral cavities. An infusion was started before he left the operating room, and continuous irrigation of the bladder begun on his return to the ward. During the operation the pulse varied from 80 to 110, being 90 at the end.

Convalescence.—The patient reacted well. For two days the temperature rose to 100.5°, but after that remained practically normal for six days. The gauze drains were removed in 30 hours. On the first and second days the drainage tubes became plugged with blood several times, causing the bladder to fill up and producing intense pain. Boric irrigations would give instant relief each time. The tubes were removed in 48 hours and patient was up on the third day. The urine began to flow through the urethra on the seventh day, and the perineal fistula closed on the 14th day. The right epididymis became inflamed on the ninth day, but subsided under ice caps in a few days. On the 14th the patient was able to hold his urine as long as five hours and had no dribbling. On the 18th day the right epididymis became slightly swollen and tender, but subsided after a few days. The patient took nitrites and the blood pressure remained between 130 and 140. The patient was kept fairly quiet, not being allowed to take as much exercise as usual. He was discharged on the 27th day. He was then able to retain his urine four or five hours, had not been instrumented and his general health excellent, the wound completely closed.

July 5, 1905.—Letter. Last night I only urinated twice, my bladder holds eight ounces, my urine is clear, acid, and contains no pus.

November 30, 1905.—Letter. I void urine naturally, usually once at night and two or three times during the day, eight or nine ounces at a time. I suffer no pain, have had no use for catheters and consider myself cured. I have erections, and have had intercourse many times.

May 15, 1906.—Letter. I void urine naturally, 250 cc. at a time, two or three times during the day and usually once at night. I have erections and satisfactory intercourse. I have had no complications nor treatment. The wound has remained healed, and I consider myself cured.

Case 92.—*Considerable enlargement of median and lateral lobes. Large vesical calculus. Contracted bladder. Result: Removal of obstruction. Frequency of urination due to contraction of bladder.*

No. 938. D. M. I., age 67, widowed, admitted May 18, 1905.

Complaint.—" Enlarged prostate."

No history of gonorrhœa.

Present illness began five years ago with frequency of urination and hesitation at the beginning. One year later he began to have pain during urination and diagnosis of vesical calculus was made, but he did not submit to operation. He has never had retention and does not use a catheter.

S. P.—Micturition every 15 minutes during the night, and about every hour during the day. Very little pain on voiding, but considerable pain after micturition, referred to the middle of the penis, no hematuria, no pain in hips, thighs or rectum. Has not lost weight. Sexual powers have been absent for several years. General health good.

Examination.—The patient is emaciated and his lips are pale. Lungs negative.

Heart.—Soft systolic murmur at apex, not transmitted to axilla, systolic murmur heard over the vessels in the neck.

Rectal examination.—The prostate is considerably enlarged, forming a mass about the size of a large lemon. The contour is rather irregular, especially on the left side where it is continuous with an induration extending upward and outward along the pelvic wall. The right lateral lobe is smooth and soft in consistence, and tender near its apex. The left lateral lobe is also smooth, fairly soft, but not tender. At the upper end running outward are several hard cords adjacent to the induration described above. Indurated cords are also felt, extending upward and outward from the upper end of the right lateral lobe and forming a bundle about 1½ cm. in diameter. The notch at the upper end of the prostate is replaced by a transverse firm band of tissue, but it is not of stony hardness and has no sharp concave border as in certain cases of carcinoma. No enlarged glands are to be felt in the pelvis.

Urinalysis.—Slightly cloudy, acid, sp. gr. 1010, no sugar, albumin a slight trace, urea 12 gm. to the liter. Microscopically, pus cells, bacilli and cocci.

Cystoscopic examination.—The catheter passes with ease and finds about 100 cc. residual urine. The bladder is very irritable and will not admit 100 cc. of irrigating fluid. Lavage caused hemorrhage and cystoscopic study was unsatisfactory It was possible, however, to make out a large globular median lobe, and a large, dark, irregular mass lying in front of it against the anterior wall of the bladder. Owing to hemorrhage it was impossible to say whether it was stone or neoplasm. Palpation of the hypogastric region shows that the bladder is small, and markedly indurated and thickened.

Operation, May 22, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes which were fairly large were removed in two pieces. The middle lobe, which measured 3 x 4 x 5 cm. in size was drawn down by the tractor and enucleated through the right lateral cavity. In these manipulations the urethra was not torn, but the vesical mucous membrane covering the apex of the middle lobe was removed. A stone forceps was then inserted through this opening and a calculus measuring 2 x 2½ x 3 cm. in size was extracted. The wound was closed as usual with double catheter drainage and light gauze packs for the lateral cavities. There was very little hemorrhage and the patient stood the operation well. A submammary infusion was given on return to the ward and continuous irrigation begun. The pulse at the end of the operation was 100, and half an hour later 72.

Convalescence.—The patient reacted well. On the day following the operation the temperature rose to 101.8°, but fell to normal the next day, and after four days remained normal. The irrigation was discontinued after 12 hours. The gauze packing was removed without causing hemorrhage after 24 hours, and the tubes were removed the next day. The patient was up in a chair on the third day, and walked at the end of a week. The urine did not pass through the penis until the 13th day, but the fistula closed completely on the 18th day. He began to have control on the tenth day, and was discharged from the hospital on the 22d day. At that

time he was able to retain his urine for three hours, voided in a large stream without pain, and his general health was excellent.

November 30, 1905.—Letter. I void urine naturally, four or five times during the day and three or four times at night, from one-half to one pint at a time. The wound is closed and I consider myself cured. I have had no erections. (These were absent before operation). My general health is good.

May 9, 1906.—Letter. I am cured. I void urine naturally and at normal intervals during the day, but often three or four times at night. My general health is good, and I have gained in weight.

Pathological report.—The specimen, G. U. 165, consists of the three lobes of the prostate removed in five pieces, and weighs about 65 gm. The median lobe is the largest, has been removed in one piece, and measures 6 x 5 x 2.5 cm. in size. It is smooth, globular, has no mucous membrane attached to it, and on section shows gland tissue with little intervening stroma. The lateral lobes have been removed, each in two pieces, and are each about 3 cm. in diameter. They are fairly smooth and on section show more stroma than the median lobe. No mucous membrane, no ejaculatory ducts, no calculi.

Microscopic examination.—The picture in all three lobes is that of a very glandular tissue arranged in spherical lobules. The acini are for the most part small, with occasionally very regular lumina, and here and there is seen one considerably dilated. The epithelium lining the acini is of the usual tall cylindrical type, in places growing out into the lumina of the ducts in solid tufts of cells. The stroma is for the most part very compact, although here and there seems rather loosely bound. It is composed of muscle and fibrous tissue in varying proportions. Quite frequently one sees well marked concentric bands of muscle fibers closely encircling the acini. Here and there in the stroma are areas of round cell and polynuclear infiltration with occasional evidence of peri glandular and interstitial inflammatory tissue. Occasionally one sees quite numerous pus cells in the lumen of an acinus and not infrequently some in acini which show no inflammatory process either in the the parenchyma or its immediate vicinity.

The hypertrophy is of a distinctly adenomatous type with practically no cystic degeneration, and with a comparatively small amount of fibro-muscular stroma.

Case 93.—*Fairly large hypertrophy. Catheter life seven years. Cured. Followed one year.*

No. 908. W. H. B., widowed, age 76, admitted April 25, 1905.

Complaint.—"Prostatic hypertrophy. Catheterism."

No history of gonorrhœa or previous urinary trouble. Onset 13 years ago with slight increased frequency of urination. In 1896 began to use a catheter occasionally. Retention of urine has been complete for the past 10 months and the catheter employed two to four times during the day.

He has no pain, but finds the catheter an unbearable nuisance, and at times difficult to introduce. Pain is not a marked symptom. Erections have been absent for the past two years.

Examination.—A vigorous looking man for his age. There is slight arteriosclerosis. Pulse regular and 80 to the minute. A slight systolic murmur at apex of heart. Lungs and abdomen negative.

Rectal examination.—The prostate is considerably hypertrophied, forming a globular mass the size of an orange. It is round, smooth, elastic and without induration or tenderness. No enlarged glands are present. Both epididymes are indurated.

Urinalysis.—Slightly cloudy, sp. gr. 1024. Albumin considerable, no sugar, acid, pus cells and cocci in large numbers. Urea 21 gm. to the liter.

Cystoscopic examination.—A silver catheter enters with ease. The bladder capacity is large, tonicity is good, retention of urine is complete. The cystoscope shows a slight enlargement of the right lateral lobe, a very prominent intravesical hypertrophy of the left lobe, projecting anteriorly, and small rounded median lobe. The bladder is considerably trabeculated with small pouches, but no diverticula. The ureters cannot be seen on account of the middle lobe. No calculus is present. With the finger in the rectum and cystoscope in the urethra the beak is easily felt, and the thickness of the posterior commisure is only slightly greater than normal (cystoscope in sulcus to one side of middle lobe).

Preliminary treatment.—The patient was instructed to take urotropin and to drink water in abundance, and to return later for operation. Nitro glycerine and nitrites for two days previous to operation on account of high blood pressure, 210 mm.

Operation, May 22, 1905.—Ether. Perineal prostatectomy by the regular technique. The median lobe was removed through one of the lateral cavities and was about the size of a cherry. The lateral lobes were moderately enlarged. The ejaculatory bridge and floor of the urethra were preserved intact, and only a small linear tear was made in the lateral walls of the urethra, the bladder was not torn. There was very little hemorrhage, and the patient stood the operation well. Closure, as usual, with double tube drainage and continuous intravesical irrigation before leaving the table and after return to the ward. Submammary infusion was given after the operation. At beginning of operation pulse 85, blood pressure 180, at end of operation pulse 65, blood pressure 125.

Convalescence.—The patient reacted well. The gauze drainage was removed on the next day and the tubes on the second day, continuous irrigation having been maintained over night. The perineal fistula closed on the twenty-first day. No epididymitis or other complications occurred. Highest temperature 100.8° on second day after operation.

June 20, 1905.—Patient drinks two quarts of water a day and voids from 11 to 24 times. Has no incontinence, but when bladder becomes full the sphincter is a little weak. The wound is tightly healed. The urine is clear, acid, and contains only a few pus cells and bacteria. A silver cath-

eter passes with ease and finds 22 cc. residual urine. There is no evidence of stricture and patient has not been instrumented since the operation. Patient left the hospital on the 33d day.

September 23, 1905.—Letter. It is now four months since the operation. All has gone well in every way. I have satisfactory retention of urine, only occasionally the merest dribble of a few drops, apparently due to nervous causes. I am riding my bicycle.

November 21, 1905.—I have satisfactory control of my urine. There has been a slight return of erections and my general health is excellent. I have perfect freedom from a load of discomfort under which I had been for years, and have a new lease on life.

November 30, 1905.—Letter. I void urine naturally about 10 times in the day and once or twice at night, rarely over 325 cc. at a time, occasionally 400 cc. I suffer no pain, the wound has remained healed. I have incomplete erections. My general health is excellent. Last night I slept seven and one-half hours without urinating.

May 7, 1906.—The wound has remained closed. I void urine naturally, and at normal intervals, from 300 to 350 cc. at a time. I have no pain, have semi-erections, have not attempted intercourse. I have had no complications nor medical treatment. My general health is excellent and I consider myself cured.

May 22, 1906.—Letter. It is a year since the operation. I pass my urine naturally, have satisfactory control, and only dribble occasionally (at intervals of days) when convenient opportunity of relief is poor and when the bladder gets too full. The intervals are between four and five and one-half hours, and the amounts voided from 200 to 300 cc.

Pathological report.—The specimen, G. U. 166, consists of the three lobes of the prostate removed in five pieces, and weighing about 30 gm. The left lateral lobe measures 3 x 3 x 1.7 cm., is fairly smooth and on section shows gland tissue and a considerable amount of stroma. The right lobe measures 3.5 x 2.5 x 1.7 cm., and has been removed in two pieces, is somewhat torn and irregular, and is apparently more fibrous than the left. One dilated cyst seen. The median lobe forms a globular mass about 2 cm. in diameter and has been removed in two pieces. It is apparently more glandular than the lateral lobes. No mucous membrane, no ducts, no calculi removed.

Microscopic examination.—This shows in the middle and left lateral lobe an adenomatous hypertrophy in which the gland tissue is largely arranged in lobules. In areas many of the acini are very much dilated and lined with a single layer of flattened epithelium. In areas they are about normal in size, and again in other areas somewhat dilated with irregular lumina. The gland tissue is very much in excess of the stroma, which is of a fairly compact nature. Surrounding the glandular lobules the stroma is fairly compact, and its contained ducts are very much compressed. The stroma is composed of both muscle and fibrous tissue; the fibrous tissue somewhat predominating. Here and there is some round cell infiltration. The right lobe is also

distinctly adenomatous in nature, but its ducts show practically no cystic degeneration, and there are distinct areas of connective tissue hypeplasia. It contains more stroma than either the middle or left lobe.

Case 94.—*Slight enlargement of lateral lobes. Cystin calculus. Contracted bladder. Cured.*

No. 913. W. B. E., age 67, married, admitted April 27, 1905.

Complaint.—" Enlarged prostate."

The patient never had gonorrhœa.

Present illness began about one year ago with slight increase in the frequency of urination. About six months ago he began to have a sharp pain in the glans penis at the end of micturition. He has never had retention of urine and no catheter has been introduced. He has been unable to have sexual intercourse for one and one-half years.

S. P.—Voids once or twice at night and six or eight times during the day. Micturition accompanied by pain at the end of the penis, and slight tenesmus.

Examination.—The patient is a sturdy looking man. Heart, lungs, and abdomen are negative. The prostate is enlarged in both lateral lobes, the left being the larger. The median furrow and notch are wide and deep. The general contour is rounded, smooth, fairly hard, but no nodules are present and there is no induration in the region of the seminal vesicles. The prostatic secretion contains a few pus cells, a large number of granule cells and very few lecithins. The urine is slightly cloudy, acid, albumin present, no sugar. Urea 13 gm. to the liter. Microscopically pus cells and a few bacteria.

Cystoscopic examination.—Coudé catheter passes with ease and finds 15 cc. residual urine. The bladder is contracted, holding only 160 cc. The cystoscope shows a slight hypertrophy of the median portion in the shape of a small, rounded lobe. The lateral lobes are only slightly enlarged. In the bladder is seen a small oval calculus with a coarsely granular surface composed of yellowish crystals.

Operation, May 22, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were only slightly enlarged, measuring 2 x 2½ x 3 cm. in size. The urethra and bladder were not torn in their removal. The tractor was then removed and the urethra split along its left lateral wall, the vesical orifice dilated, the stone forceps introduced and an oval calculus 1.5 x 2 x 3 cm. in size removed. It is roughly granular, its surface being composed of numerous crystalline spicules, amber in color and very hard (chemical examination showed it to be composed of pure cystin). Insertion of the finger after the removal of the calculus showed no enlargement of the median portion of the prostate. It had apparently been sufficiently removed with the lateral lobes. The lateral cavities were packed with gauze. Double catheter was inserted into the bladder through the perineum and the wound closed as usual. Submammary infusion and continuous irrigation on return to ward.

Convalescence.—The patient reacted well. The gauze was removed in

36 hours and the tubes in 48. Urine began to come through the penis on the fifth day and the fistula closed on the 18th. He was out of bed on the fifth day, but did not walk until the eighth. Highest temperature 100.2° on third day after operation, after that normal.

June 14, 1905.—The patient voids urine freely in a good stream at intervals of from three to five hours during the day and only once at night. Has good control, no dribbling, slight precipitancy at times. A coudè catheter passes easily, there is no residual urine. The urine is cloudy and contains a few pus cells and bacteria. Discharged from the hospital on the 24th day.

July 5, 1905.—Letter. Yesterday I passed a small calculus without pain or hemorrhage.

November 30, 1905.—Letter. I void urine naturally and consider myself cured. I have no pain and often void a pint at a time. I urinate two or three times at night and six or seven times during the day. I have no erections, but these were absent before the operation.

May 8, 1906.—Letter. I void urine naturally, once during the night and at normal intervals during the day, and occasionally void a pint of urine at a time. I have no pain. . Erections are partial. I have not attempted sexual intercourse. My general health is good. I have gained in weight and consider myself cured.

Pathological report.—The specimen, G. U. 163, consists of the two lateral lobes of the prostate, each in one piece and weighing all about 15 gm. The right lobe measures 3 x 2.5 x 2 cm. is fairly smooth, encapsulated, and on section shows considerable gland tissue with dilated acini. The left lobe measures 2.5 x 2.3 x 2 cm., and contains a cavity about 5 mm. in diameter from which a calculus has been removed. The cut surface shows gland tissue with very little stroma, no cystic dilatations, and one or two seed calculi. No mucous membrane or ejaculatory ducts have been removed.

Microscopic examination.—The hypertrophy is of the glandular type with some arrangement in lobules. The gland acini show the usual dilatation with complexity of the lumina and areas of cystic degeneration. There is present much endoglandular sprouting. The stroma contains very much more fibrous tissue than muscle. Some areas of prostatitis and numerous corpora amylacea are seen.

CASE 95.—*Moderate hypertrophy of median and lateral lobes. Complete retention. Catheter life. Cured. Followed 12 months.*

No. 937. T. S. N., age 59, married, admitted May 5, 1905.

Complaint.—" Enlarged prostate."

No history of gonorrhœa.

Present illness began three years ago with burning pain on urination, slight hesitation and some straining. He had no particular inconvenience until two years ago when urination became quite frequent and difficult. In a few weeks he was voiding every hour night and day. He had no acute retention of urine, but on the advice of a physician he began

the use of a catheter now almost two years ago, and since then has been unable to void naturally except small amounts very occasionally. About nine months ago he had epididymitis on the left side, and since then three other attacks on this side and one on the right. He has never had hematuria nor passed a calculus. His general health is excellent, his sexual powers are good.

S. P.—A catheter is used three or four times a day. He suffers no pain, has no hematuria, and his general health is excellent and he begs to be relieved of the catheter life.

Examination.—The patient is well nourished with mucous membranes of good color. His chest and abdomen are negative. Genitalia: Both epididymes are hard and tender.

Rectal examination.—The prostate is only moderately enlarged. It is smooth, soft, globular in shape and is not tender. Extending upward and outward from the upper end of the prostate on each side is a smooth, hard cord about the size of a small lead pencil, the upper limits of which are impossible to reach. The diagnosis of indurated vasa deferentia is made. Seminal vesicles are not palpable; there are no glands to be felt.

Urinalysis.—Slightly cloudy, acid, sp. gr. 1016, no albumin, no sugar. Urea 15 gm. to the liter. Microscopically pus cells and bacilli.

Cystoscopic examination.—The patient has complete retention of urine. Bladder capacity 600 cc. Tonicity good. A stricture of large caliber is present one inch from the meatus, which grips the cystoscope. The cystoscope shows a small round median lobe with a deep sulcus on each side and very little intravesical hypertrophy of the lateral lobes. A small polyp is seen attached to the right lateral lobe, the mucous membrane elsewhere is smooth and regular. The bladder is markedly trabeculated, but only slightly inflamed. There are numerous cellules and diverticula on the posterior and lateral walls, but no foreign bodies are present. The ureters cannot be seen on account of the middle lobe. With the finger in the rectum and cystoscope in the urethra the amount of the tissue is not greatly increased. (Cystoscope in one of the sulci.)

Operation, May 22, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes which were only moderately hypertrophied were easily enucleated, each in one piece. The median bar was removed in two pieces, one through each lateral cavity. It was impossible to engage the small median lobe with the blade of the tractor which was therefore withdrawn and the finger inserted through the urethra to push the middle lobe into the left lateral cavity where it was easily enucleated. Urethra was torn on each side, but no mucous membrane was removed, and the floor of the urethra and ejaculatory ducts were preserved intact. The wound was closed as usual with double catheter drains and light packs for the lateral cavities. An infusion was given on return to the ward and continuous vesical irrigation begun. The patient stood the operation well. Pulse varying from 95 to 115, 110 on return to the ward.

Convalescence.—The patient convalesced rapidly. The temperature did

not rise above 100°. The gauze was removed after 24 hours and the tubes in 48 hours. Urine began to come through the penis on the fifth day. He had good control on the eighth and by the twelfth day could retain urine for several hours. The perineal fistula closed on the fifteenth day. He was out of bed on the third day, and began to walk in the first week. Erections returned on the fourteenth day. On the twentieth day a catheter was introduced and found 40 cc. residual urine. He was discharged from the hospital on the twentieth day.

June 19, 1905.—The patient is in excellent condition. Retains urine for five hours during the night and four hours during the day. The stream is large, there is no hesitation and no incontinence. The perineal wound is closed. A large silver catheter passes with ease, no obstruction is present, residual urine 10 cc.

November 30, 1905.—Letter. I void urine naturally three or four times during the day and rarely ever more than once at night, from 12 to 16 ounces at a time. Occasionally I have a slight pain when urinating. The fistula is closed. Erections have returned but are only partial. I have had sexual intercourse, but the ejaculation is slight and not entirely satisfactory. My general health is excellent.

May 10, 1906.—Letter. I void urine naturally as much so as when a boy, at normal intervals and very rarely have to get up at night. I have no pain, no incontinence, no fistula. Erections have returned and I have sexual intercourse, not quite as satisfactory as before. I consider myself perfectly cured. My recovery seems like a miracle.

Pathological report.—The specimen, G. U. 167, consists of the three lobes of the prostate removed in four pieces and weighs about G-20. The left lobe measures 2.5 x 2.5 x 1.5 cm., is fairly smooth with considerable capsule, and on section shows an abundance of gland tissue and a small amount of stroma. The right lobe measures 3.5 x 2 x 1.5 cm., and is similar in character to the left. The median lobe has been removed in two pieces each about 2.5 x 1.5 x 1 cm. in size, one of which formed a pedunculated intravesical lobe, oval in shape, but contains no mucous membrane. No ejaculatory ducts or calculi removed.

Microscopic examination.—Both lateral lobes and the middle lobe show practically the same type of hypertrophy, which is a distinctly adenomatous one. The gland tissue is arranged somewhat in lobules, and there is considerable dilatation of the culs-de-sac. The majority of the acini show a considerable complexity due to the folding and papillomatous outgrowth of the lining walls. The epithelium is of a tall cylindrical type, in places of one layer deep, and others many layers, and again growing out in apparently solid epithelial masses into the lumen. The stroma is fairly compact, and composed of more fibrous than muscle tissue. The gland tissue is very much more in excess than the stroma. There is considerable round cell infiltration in various areas. This infiltration is mostly limited to the interstitial tissue, although in a few areas being most marked about the acini.

CASE 96.—*Very large prostate with great median lobe, with villous surface. Diagnosis, malignant. Suprapubic drainage. Later perineal prostatectomy. Cure.*

No. 944. J. C., age 68, married, admitted September 29, 1904.

Complaint.—" Prostatic hypertrophy, catheterism."

The patient had never had gonorrhœa.

Present illness began 14 years ago when the patient noticed a slight difficulty and increased frequency of urination. The first retention of urine came on 12 years ago. Since then the catheter has been used at irregular intervals, but the patient has always been able to void a small amount naturally. Of late he has been suffering pain and severe spasm in the bladder which frequently comes on 10 or 12 times a day. He usually passes the catheter as soon as the spasm has subsided, and finds urine, but sometimes the bladder is completely empty. He has had no pain in the back, buttocks, or groins, but he frequently has a severe pain in both legs from which he only can find relief in the kneeling posture. Two months ago he had a considerable hemorrhage from the bladder which continued for a week. There has been none since. He has lost considerably in weight.

S. P.—The frequency of urination is very variable, at times every half hour at others every two hours. When the desire to urinate comes on he has a severe pain and a spasm at the neck of his bladder. He catheterizes himself from three to six times a day, but usually finds only two or three ounces of residual urine.

Sexual powers.—Normal.

Examination.—The patient is a rather pale looking man. Heart, lungs, and abdomen negative.

The right testicle and epididymis are enlarged and indurated. There is no hernia present.

Rectal examination.—The prostate is considerably enlarged about the size of a medium sized orange. Smooth, rounded, soft, elastic, no nodules, no induration. The median furrow and notch are shallow. Seminal vesicles not palpable nor enlarged, but there is no induration above the prostate, and the rectal wall is soft and not adherent and no glands are to be felt.

Cystoscopic examination.—A coudé catheter cannot be passed owing to obstruction in the prostatic urethra. A silver catheter passes with some difficulty and produces hemorrhage which requires the use of adrenalin. Residual urine 250 cc. is present. The cystoscope shows a very extensive outgrowth from the prostate on all sides. The surface is irregular, in places villous in type, in others fissured, and in places frayed out and white. On the left side the growth extends far out into the bladder and has the appearance of a large vesical tumor, but examination shows that it springs from the left lobe of the prostate. It is difficult to see more than a small portion of the bladder which is found to be greatly trabeculated with numerous diverticula. With the finger in the rectum

and cystoscope in the urethra it is impossible to feel the beak of the instrument, the amount of tissue in the median portion being very extensive.

Urinalysis.—Very purulent. Microscopically red blood cells, pus, bacilli, and cocci. Slightly acid, no sugar, small amount of albumin.

Remark.—The diagnosis of carcinoma of the prostate with extensive intravesical tumor outgrowth was made upon the appearance of the intravesical mass, pain and the loss of weight. Rectal examination did not suggest malignant disease.

Operation, September 30, 1904.—Ether. Suprapubic cystostomy for drainage. Examination of the bladder with the finger showed an extensive outgrowth of the prostate which filled the base of the bladder. Its surface was very irregular, fissured, villous, and in places granular and quite firm. The diagnosis of carcinoma seemed entirely confirmed, and extirpation not attempted.

Convalescence.—The patient improved rapidly after the operation, was up in a wheel chair on the 11th day and discharged on the 28th day. He then had a healthy suprapubic fistula in which he wore a hard rubber tube connected with a Bloodgood bag.

May 19, 1905.—The patient returns for examination. He has worn the Bloodgood drainage apparatus since leaving the hospital. He has had no pain, but there has been considerable leakage around the tube and he is uncomfortable. Hemorrhage occurred for the first time last week. He has gained 15 pounds in weight and his health is excellent.

Rectal examination.—The prostate is in the form of a smooth globular mass about the size of a medium sized orange, elastic, fairly soft, and without induration. The cystoscope shows an entirely different picture around the prostatic orifice. The villi and fissures have completely disappeared and there are present now two large lateral lobes connected by a fairly large median bar. The mucous membrane covering them is granular, but not irregular, and the appearance is that of an ordinary hypertrophy and does not suggest malignancy. Perineal prostatectomy is advised.

Operation, May 22, 1905.—Ether. Perineal prostatectomy by the usual technique. The left lateral lobe, the median bar and the right lateral lobe were removed in one piece without destroying the floor of the urethra, the right lobe having been drawn after the median bar beneath the urethra into the left lateral cavity. The tractor was then removed and a finger inserted into the bladder, and a fairly large rounded median lobe, which had dropped well back on the tractor was found. It was drawn up by the finger until it presented into the left lateral cavity and enucleated, but in doing so a small tear was made in the mucous membrane covering it. The ejaculatory ducts and floor of the urethra were preserved intact. The usual closure was employed, lateral cavities being packed with gauze and double catheter drainage for the bladder. There was moderate amount of hemorrhage and the patient stood the operation well. Continuous irrigation and a submammary infusion were given on return to the ward. Pulse at the end 110.

Convalescence.—The patient reacted well, the temperature rose to 101.4° on the day after the operation, but after the fourth day was practically normal. The gauze was removed on the day after the operation and the tubes on the next day. The patient was up in a wheel chair on the second day. Urine flowed through the urethra on the fifth day. The suprapubic fistula closed on the seventh day, and the patient was discharged on the 32d day. His general condition then was excellent, nearly all of the urine passed through the meatus, a small fistula was present in the perineum. The perineal fistula closed on August 1, 1905, 70 days after operation.

November 30, 1905.—Letter. I urinate seven or eight times during the day and once or twice at night and often pass 250 cc. at a time. I am free from pain and my general health is excellent. The wound is completely closed, but there is a slight rupture in the suprapubic scar. I have no erections. I have had a swelling of the left testicle.

May 7, 1906.—Letter. I void urine naturally, in large amounts, but more frequently than normal, seven or eight times during the day and two or three at night, and about half a pint at a time. I suffer no pain and consider myself cured. I have erections but they are not perfect, and have not attempted intercourse. I passed two calculi last month. My health is excellent.

Pathological report.—The specimen, G. U. 168, consists of three lobes of the prostate, and weighs about G-85. The right and left lobes and the median bar have been removed in one piece. The right lobe measures 5 x 4 x 3 cm. The left measures 6 x 3.5 x 3.5 cm. and the median bar joining them is 3 cm. wide and 2 cm. thick. There is no mucous membrane attached to these lobes which are irregular along the urethra, but smooth externally. The median lobe has been removed separately in two pieces, measuring 5 x 3 x 3 cm. and 2 x 2 x 1.5 cm. in size respectively. On section there is considerable glandular tissue with small amount of stroma. No induration or areas suggesting malignancy. No mucous membrane, no ejaculatory ducts and no calculi have been removed.

Microscopic examination.—The lateral lobes show an adenomatous type of hypertrophy. The ducts in many lobules show much cystic degeneration with flattening of the epithelium. In other areas the ducts are not so much dilated, but there is very marked complexity of the gland. The stroma is in places fairly thick, and in other areas, where the gland tissue is particularly abundant, is composed of slender bands. The stroma is rather dense, and composed for the most part of muscle and fibrous tissue in fairly equal parts. In a few limited areas there is some round cell and polynuclear infiltration.

The middle lobe contains distinctly less gland tissue than the lateral lobes, and there is considerable connective tissue hyperplasia. The ducts, which are present, are for the most part undilated although here and there one finds a few acini which have undergone cystic degeneration.

This is distinctly an adenomatous type of hypertrophy in the lateral lobes, while the middle lobe is less adenomatous, and contains considerably more fibrous tissue than the lateral lobes.

CASE 97.—*Moderate hypertrophy of median and right lateral lobes. Great hypertrophy of the left lateral lobe, with intravesical villi suggesting malignancy. Suprapubic exploration. Perineal prostatectomy. Cure.*

No. 894. J. L. McW., age 61, married, admitted April 24, 1905.

Complaint.—"Prostatic trouble."

No history of gonorrhœa.

Present illness began six years ago with difficulty of urination which gradually increased and five years ago complete retention of urine set in and he had to be catheterized. After that the patient was able to void, but urinated frequently and in a small stream. On January 29, 1905, retention of urine came on a second time, and as his physician was unable to pass a catheter, suprapubic aspiration was performed. Later a silver catheter with a large curve was passed, but in a short time the patient was able to void again and has not been catheterized since.

S. P.—Urination three times during the night, four times during the day. Urine difficult to start, stream small and slow, slight dribbling at end. No blood, no pain, general health excellent. Sexual powers are weak. Erections imperfect. Sexual desire about normal.

Examination.—Patient is a well nourished man, lips and mucous membranes of good color. Heart, lungs, and abdomen negative.

Rectal examination.—The prostate is considerably enlarged, being about the size of a medium-sized orange. It is smooth, rounded, soft, there are no areas of induration and no nodules, and the upper end is reached with difficulty. Seminal vesicles are not palpable, but there is no induration in this region. The prostatic secretion contains a few pus cells, granule cells, spermatozoa and a few lecithin bodies.

Urinalysis.—Clear, acid, sp. gr. 1022, no albumin, no sugar, urea 13 gr. to the liter. Microscopically red-blood corpuscles, no pus cells, no bacteria.

Cystoscopic examination.—A coudé catheter passes with ease and finds 40 cc. residual urine and a bladder capacity 320 cc. The cystoscope shows a moderate enlargement of the median lobe and a fairly considerable intravesical enlargement of the left lateral lobe. The right lateral lobe is only slightly enlarged intravesically. The surface of the median lobe is irregular and one large polypoid mass is seen attached to its posterior surface. Looking upward and to the left several irregular fissures are seen. There are no definite villi and no ulcerations, and the bladder wall is trabeculated and shows no evidence of infiltration. The cystoscopic examination suggests malignancy owing to the irregularly lobulated and fissured condition of the intravesical portion and the adherent polyps, but rectal examination does not at all suggest malignancy. The history is also against malignancy, but in order to be certain it is thought best to perform a suprapubic cystostomy for exploration previous to prostatectomy through the perineum.

Operation, April 28, 1905.—Suprapubic cystotomy for vesical examination. Diagnosis, benign hypertrophy. Closure of the bladder with three interrupted sutures. Partial closure of the abdominal wound with catgut. The

patient was then placed in the lithotomy position and perineal prostatectomy performed by the usual technique. The left lateral lobe was found to be greatly hypertrophied measuring 5 x 6 x 8 cm. in size. It was quite adherent to the urethra and to the bladder, but was enucleated without removing any of the mucous membrane. The right lateral lobe was much smaller measuring 2 x 3 x 4 cm. in size, and attached to it was the median lobe which was enucleated in one piece with it. A small tear was made in the urethra but no mucous membrane was removed and the ejaculatory ducts were preserved. The wound was closed as usual with double catheter drainage and light packs for the lateral cavities. Saline infusion on return to ward, no continuous irrigation on account of suprapubic suture of vesical wound. The patient stood the operation well. The hemorrhage was slight. Pulse at the end 95, one hour later 88.

Convalescence.—Patient reacted well and the temperature rose to 106.6° the day after the operation, but was normal on the third day. The gauze packs were removed from the perineal and suprapubic wounds in 48 hours and the tubes the same day. The suprapubic vesical wound did not leak, the abdominal wound healing nicely by granulation. No urine came through the penis until the 15th day. After that the perineal fistula closed slowly, but a few drops escaped through it on his discharge on the 24th day. Interval urination, however, had been present since the removal of the perineal tubes, and he was able to retain his urine three hours and had no incontinence. A silver catheter passed with ease, no stricture or other obstruction, no residual urine present. The fistula was curetted and the patient was discharged. Urine contained a few pus cells and bacilli. Before leaving patient reported that he had several erections. Owing to suprapubic wound the patient was confined to his bed for two weeks. The perineal fistula closed on the 30th day.

February 8, 1906.—Urination is entirely satisfactory, three times during day and twice at night, four or five ounces at a time, entirely without pain. I have erections but very seldom and rather weak. I have sexual intercourse occasionally, but the ejaculation is slow and the emission scant.

May 7, 1906.—Letter. I void urine naturally three times during the day and about twice at night, about six ounces at a time. I have no pain. I have erections, but not as firm as normal and the ejaculation is slow. I have had intercourse occasionally. My general health is excellent, I have gained in weight and consider myself cured.

September 14, 1906.—Letter. The perineal wound has remained closed. I void urine naturally five times in 24 hours and consider myself cured. I have erections and sexual intercourse. My general health is excellent.

Pathological report.—The specimen, G. U. 150, consists of two pieces, the two lateral lobes and weighs about G-60. The left lateral lobe is smooth, oval, slightly lobulated mass 7 x 5 x 4.5 cm. in size, and on section shows a very thin capsule, moderate amount of gland tissue and considerable stroma with few dilated ducts. The right lateral lobe is much smaller, measuring 6 x 3 x 3 cm. in size, and is similar in appearance to the left. No mucous membrane, no ducts, no calculi.

Microscopic examination.—This hypertrophy is of the usual glandular type with areas of gland aggregation. The acini are for the most part dilated, and there is present a considerable amount of endoglandular papillomatous growth. Some glandular and interstitial prostatitis is present with small accumulations of inflammatory cells at several points almost suggesting small abscesses. The stroma is about two-thirds fibrous tissue although there are areas where the muscle element is equal to, if not in excess of, the connective tissue.

CASE 98.—*Moderate hypertrophy of median and lateral lobes Cure. Followed 11 months.*

No. 1001. M. S., age 60, married, admitted June 3, 1905, St. Francis Hospital, La Crosse, Wisconsin.

Complaint.—"Frequent urination."

No history of gonorrhœa.

Present illness began eight years ago with hesitation at beginning of urination, and straining. Urination gradually became more frequent, and he now urinates about 10 times at night and every hour during the day, There is an occasional burning sensation at the end of the penis, but no definite pain.

Sexual powers.—No note made.

Examination.—Patient is a sturdy looking man. Chest and abdomen are negative.

Rectal.—Prostate is moderately enlarged, smooth, elastic, no induration, no nodules.

Cystoscopy was not performed. There was considerable residual urine, but no note has been made as to the amount.

Operation, June 9, 1905.—Ether. Perineal prostatectomy by the usual technique. Two fairly enlarged lateral and a small median lobe were easily enucleated without removing any of the mucous membrane of the urethra, and the ejaculatory ducts were preserved intact.

The patient stood the operation well. The wound was closed as usual with double drainage tubes and light packs for the lateral cavities. The patient stood the operation well. Infusion and continuous irrigation on return to room.

Convalescence.—Continuous irrigation discontinued after 14 hours. The gauze and tubes were removed on the second day and soon after the urine came through the anterior urethra. The patient had no temperature above 99°, was up on the second day, and on the 14th day could retain urine for five hours. The perineal fistula closed completely on the 17th day, and the patient was discharged on the 18th. At that time he could retain urine five hours. Had no pain, fistula had reopened and a few drops of urine had escaped through it. His condition was excellent and the urine apparently normal. The fistula finally closed.

November 30, 1905.—Letter. The wound has remained closed, I void urine naturally, about one-half pint at a time about four or five times during the day and twice at night. I suffer no pain, have not been instru-

mented since operation and consider myself cured. I have erections and satisfactory sexual intercourse. I have had no complications and my general health is good.

May 5, 1906.—Letter. I void urine naturally at fairly normal intervals, one-half a pint at a time. I suffer no pain. Sexual intercourse is satisfactory. I have had no complications or treatment, and consider myself cured.

Pathological report.—The specimen, G. U. 264, consists of three pieces, two lateral lobes and a small median lobe, whole weighing about 25 gr. The median lobe measures only 1.5 x 1.3 x .8 cm. is irregular and on section looks fibrous. The lateral lobes are about equal in size, measuring about 3.5 x 3 x 2.5 cm., covered by fairly smooth capsule, and on section show numerous spheroids. A number of dilated acini are seen. The consistence is uniformly elastic. No mucous membrane or ejaculatory ducts have been removed.

Microscopic examination.—The hypertrophy is a lobulated glandular one. The acini are for the most part only moderately dilated, and present a rather marked papillomatous proliferation. The stroma is rather dense, almost entirely composed of fibrous tissue. There is present considerable interstitial and periglandular prostatitis.

In the middle lobe the prostatitis is more intense, and almost leads to the formation of abscesses about many groups of acini. The arteries show practically no thickening.

Case 99.—*Moderate hypertrophy of lateral and median lobes. Occasional catheterism. Cured. Followed 11 months.*

No. 1002. C. M. M., age 56, admitted June 3, 1905, at St. Francis Hospital, La Crosse, Wisconsin.

Complaint.—" Frequent and painful urination."

No history of gonorrhœa.

Present illness began five years ago with pain in the perineum and difficulty of urination which lasted only a few days, but returned six months later when retention became complete and catheterization necessary. During the next three years he had to be catheterized about 10 times, and for the past 18 months has had to use the catheter four or five times every month.

S. P.—Urine is voided four or five times during the day and 15 times at night. The amount passed is small, and there is a severe pain in the bladder and perineum before urination. His physical condition is good.

Sexual powers.—No note made.

Examination.—The patient is a strong, sturdy looking man with lips of good color.

Chest and abdomen are negative.

Rectal.—The prostate is considerably enlarged, smooth, elastic, no induration in the region of the seminal vesicles. Urine of good quality.

Operation, June 9, 1905.—Ether. Prostatectomy by the usual technique.

The lateral lobes which were considerably enlarged were easily enucleated. The median lobe was enucleated through one of the lateral cavities without difficulty, no mucous membrane being removed and only a small tear being made. Search of the bladder failed to reveal any calculus. Closure as usual with double tube drainage and light packs for the lateral cavities. Continuous irrigation and infusion on return to room, condition of patient excellent.

Convalescence.—Patient reacted well. The irrigation was discontinued after 14 hours, the packing was removed within 24 hours and the drainage tubes within 48 hours. Immediately afterwards urine was voided through the urethra, and the patient was gotten out of bed. On the fourth day nearly all of the urine came through the anterior urethra. On the sixth day the patient had a chill and temperature of 105°, but after that the temperature remained normal. The patient was discharged on the 18th day. His condition was excellent, urination three times during the day and twice at night, without pain and in a large stream, only a few drops of urine escaped through the perineal fistula.

July 11.—The perineal fistula closed, 31st day.

December 8, 1905.—Letter of physician. The wound has remained closed. Urine is voided naturally, about one-half pint at a time without pain, about five times during the day and five times at night. He has erections, but has not attempted intercourse. He has recently been troubled with a nervous disorder of the stomach. I consider him entirely cured by the operation.

May 7, 1906.—Letter. I void urine naturally, six times during the day and twice at night, about four ounces at a time. I have no pain except a burning sensation when I urinate. I have erections, but rarely, have not attempted sexual intercourse. Eight months ago I had pain in the perineum and fever followed by a discharge of pus from the urethra after which I slowly got better. I also had epididymitis on the left side. My general health is good, and I have gained in weight. I consider myself cured apart from what I have described.

September 17, 1906.—Letter. The perineal fistula closed 32 days after the operation. I void urine naturally, six or seven times a day and five times at night. The amount voided is natural. I suffer no pain, have erections and consider myself cured.

Pathological report.—The specimen, G. U. 265, consists of three lobes of the prostate removed each in one piece and weighs about G-20. The lateral and median portions of the prostate are about equal in size, each being about 3 x 2.5 x 2 cm. They are smooth, slightly lobulated, and on section show considerable gland tissue, but also a good amount of stroma. No mucous membrane, no ejaculatory ducts, no calculi removed.

Microscopic examination.—The hypertrophy is a moderately glandular one with less dilatation of the acini than one usually sees, but the off-shoots into the lumina of the acini from the lining wall are present in considerable degree. The stroma is fairly dense, but there are numerous areas where young connective tissue has been formed. Connective tissue is in excess of the muscle elements. The blood vessels seem practically normal.

Case 100.—*Large hypertrophy of median and lateral lobes. Complications: Suppuration in wound. Cholecystitis. Cured.*

No. 965. G. W. H., age 64, married, admitted June 20, 1905.

Complaint.—" Enlarged prostate."

No history of gonorrhœa.

Present illness began about eight years ago with difficulty of urination, pain and incontinence which continued for several weeks. One year later he had retention of urine for the first time, and after that with increasing frequency until three years ago when the retention became complete and chronic and he has led a catheter life. Two years ago he had epididymitis on the left side. He has had a dull aching pain in the bladder, but none elsewhere. No hematuria, no calculus.

S. P.—The catheter is used at bed time and he voids first at 4 a. m. He uses the catheter again in the morning and does not void then for four hours, after which he voids every two hours. Catheterization is often very difficult and sometimes produces hemorrhage. His general health is good.

Sexual powers.—Erections and coitus satisfactory.

Examination.—The patient is a well nourished, healthy looking man. Chest and abdomen negative.

Rectal.—Prostate is considerably enlarged, smooth, soft, no nodules or induration, the upper end can be passed with difficulty. The seminal vesicles are negative.

Cystoscopic.—A catheter passes with ease and finds 360 cc. residual urine. The bladder capacity is large. The cystoscope shows a fairly large median lobe and considerable intravesical enlargement of the lateral lobes. The bladder is trabeculated, cystitis moderate, no calculus. With cystoscope in urethra and finger in rectum, the median portion appeared quite thick and the beak could not be felt owing to the length of the prostate.

Urinalysis.—Cloudy, 1022, acid, no sugar, no albumin, pus cells and bacteria.

Operation, June 21, 1905.—Ether. Perineal prostatectomy by the usual technique. Both lateral lobes were quite large. While enucleating the left lateral lobe it was found possible by directing one blade of the tractor so as to engage the summit of the middle lobe to draw it down and enucleate it in one piece with the left lateral. A median bar was left and this was removed in two pieces also through the left lateral cavity. A tear was made in the mucous membrane of the median portion, but none removed. The ejaculatory ducts were apparently preserved. Usual closure with double drainage tubes and light packs for the lateral cavities.

The patient stood the operation well, infusion, pulse at the end 70. Continuous irrigation on return to the ward.

Convalescence.—The patient reacted well, and had a practically normal temperature and for three weeks the temperature was normal except on the fifth day when it reached to 100.5°. The tubes and gauze were removed on the third day, and interval urination was established almost at once. Urine did not flow through the anterior urethra until the 13th day.

The sutured wound did not heal per primam and left a large wound to granulate. On the 25th day there was a sudden rise of temperature to 102.9 at 6 p. m. and examination showed a distended tender gall bladder. This attack persisted for two weeks during which the patient was confined to bed.. The perineal fistula healed completely on the 40th day and he left the hospital on the 44th day in good condition, voiding urine in a free stream at intervals of three hours or more.

November 30, 1905.—Letter. The wound has remained closed. I have had no instrumentation. I void urine at normal intervals, about three-quarters of a pint at a time. Have no pain and am perfectly cured. I have had several erections, but have practically no sexual desire.

May 8, 1906.—Letter. I am perfectly cured, there is no fistula, I do not use a catheter. I have no pain. Have not had erections or intercourse. My general health is excellent. I have gained 25 pounds.

Pathological report.—The specimen, G. U. 173, consists of the prostate removed in three pieces, weighing about G-60. The left lobe is the larger, weighs G-30 and measures 5 x 4 x 3 cm. It is irregular, lobulated and on section shows many spheroids, considerable dilatation of the ducts and also considerable stroma. The right lobe weighs G-22, and measures 5 x 3 x 4 cm. It is more regular than the left and is similar in appearance. The median lobe weighs G-8, and is about 2.5 cm. in diameter, is considerably torn. No mucous membrane is attached, no ejaculatory ducts, no calculi.

Microscopic examination.—The sections show a tissue which is largely arranged in lobules. Within these lobulés the acini are very much dilated and the epithelium for the most part is flattened. There is some intracystic outgrowth in many of the dilated acini, but most of them are smooth walled, and show very little of the complexity of the wall which is present in many of the small acini. The stroma in places is quite dense, and in other places slender bands only are present between the acini. There is a very marked inflammation throughout the greatest part, and there are some areas in the denser stroma where the ducts are compressed, and chronic inflammatory tissue has been formed in quite thick bands about these acini. The amount of muscle varies in different portions, in some places being fairly abundant, while in others the connective tissue predominates.

The tissue is that of a fibro-myoadenoma in which the adenomatous tissue is very abundant especially in the lobulated areas, and has undergone quite a marked cystic degeneration. There is a very marked inflammatory change present with the formation of considerable periglandular and interstitial inflammatory tissue. Some corpora amylacea are seen.

CASE 101.—*Moderate enlargement of median and lateral lobes. Calculus in bladder. Seed calculi in prostate. Cured. Followed 11 months.*

No. 954. R. W. M., age 65, married, admitted June 8, 1905.

Complaint.—"Enlarged prostate and stricture."

Patient had gonorrhœa 30 years ago.

Present illness.—The patient has had some urinary difficulty for 20 years, beginning with a burning in the deep urethra and frequency of urination. This condition persisted for about 10 years when he was examined by a physician who told him that he had two strictures and passed instruments. This did not cure him of his trouble which has persisted up to the present time.

S. P.—His condition is now about the same as 10 years ago. He voids urine every two hours night and day, and suffers burning pain in the neck of the bladder during and after urination.

Sexual powers.—Occasionally has normal erections.. Has had no intercourse for two years.

Examination.—The patient is well nourished. Has not lost weight. Heart, lungs, and abdomen are negative.

Rectal.—The prostate is only slightly enlarged, symmetrical, distinctly harder than normal, but not of stony hardness. Smooth with no nodules. The right seminal vesicle is distinctly palpable and slightly indurated, but the left vesical is not indurated. The prostate does not extend up into the region of either vesicle, and there is no intravesicular mass.

Cystoscopic.—A catheter passes with ease and finds 450 cc. residual urine (yesterday it was 200 cc.). The cystoscope shows a slight intravesical enlargement all around the orifice in the shape of a collarette with no intervening sulci. The bladder is considerably inflamed, markedly trabeculated with several small and one large diverticula. On the trigone rests a large oval, freely movable calculus. With finger in rectum and cystoscope in urethra the prostate feels like a hard collar around the shaft, and the beak is easily felt.

Urinalysis.—Cloudy, alkaline, sp. gr. 1010, albumin a trace, no sugar. Microscopically, a few pus cells, bacilli and cocci.

Operation, June 21, 1905.—Ether. Perineal prostatectomy by the usual technique. The rectum was found very adherent to membranous urethra and apex of the prostate, and in freeing it a small tear was made into the rectum. It was not, however, until the completion of the prostatectomy. The bilateral capsular incision exposed at once multiple seed calculi in the prostatic substance on each side. These varied from 1 to 4 mm. in size. The lateral lobes were only slightly enlarged, and owing to adhesions were removed with difficulty. The urethra was then divided along the left lateral wall, the neck of the bladder dilated, stone forceps introduced and a fairly large oval calculus removed. Examination showed no further calculi. A finger in the urethra then showed a slight median enlargement which was excised. Double catheter drains were placed in the urethra which was not closed by sutures. The lateral cavities were packed with gauze. Glove finger was then inserted in the rectum and palpation with the finger of the other hand in the wound showed a tear in the anterior part of the rectum. This was closed by interrupted sutures of fine silk, two rows which were in turn covered in by a row of catgut sutures. The levator muscles were then approximated and the cutaneous wound partially closed on each side as usual. The patient stood the operation well, the pulse at the end being 95. Infusion and continuous irrigation on return to ward.

Convalescence.—The temperature arose to 101 on the day after the operation, but after that remained 100 for a week before returning to normal. On account of the wound in the rectum the bowels were not opened for six days, during which time the diet was very limited and a lead and opium pill was administered. Caster oil by mouth and an oil enema were used to move bowels. The irrigation was discontinued after 24 hours, the gauze and tubes were removed after 36 hours. He had a slight epididymitis five days after the operation, but after a few days the swelling and pain disappeared. The rectal wound healed per primam. He was discharged from the hospital on the 25th day. At that time he was able to retain urine for six or seven hours, voided in a large stream without pain, difficulty or incontinence. His condition was excellent. A pin point fistula was present which was curetted. A silver catheter passed with ease, meeting no obstruction and finding no residual. The urine contains pus cells and bacilli. The fistula finally closed on the 27th day.

July 20, 1905.—The wound is healed. The patient arose once last night to urinate, has perfect control. Has already had several partial erections.

February 19, 1906.—I void urine naturally twice at night, and sometimes a pint at a time. There is no fistula present, but the wound is a little sore. I do not have erections. My general health is good, and I have gained in weight.

May 23, 1906.—Letter. I void urine naturally and at fairly normal intervals, and from one-half to one pint at a time. I do not suffer much pain. I do not have erections. My general health is quite good. The wound has remained closed and I am very much improved by the operation.

Pathological report.—The specimen, G. U. 172, consists of two small pieces of prostatic tissue and weighs less than 10 gm. The left lobe measures 3 x 1.5 x 1 cm. and the right lobe 2.5 x 2 x .8 cm. The external surfaces are rough, irregular, torn. On section there is considerable fibrous stroma, a moderate amount of gland tissue, and no dilatation of the ducts, no mucous membrane, no ejaculatory ducts present. An oval calculus 3.5 x 2.5 x 2 cm. has been removed, is yellowish in color and finely granular.

Microscopic examination.—The section shows the tissue mostly composed of stroma. There are some areas in which the gland tissue is grouped together in fair amounts. The glands are for the most part rather small, and everywhere is present quite a marked prostatitis. About the individual acini, and those grouped in lobules, there is a very marked periglandular infiltration of round cells and polynuclears. The infiltration often extends out into the interstitial tissue for a considerable distance, but is distinctly much more pronounced immediately about the acini. About some of the glands there has been formed apparently considerable amounts of inflammatory tissue. The epithelium lining some of the ducts is, in places, thickened, and in other parts desquamated. Numerous polynuclears are present in many of the acini. The stroma as a whole is rather dense; is composed in large part of fibrous tissue, although considerable smooth muscle tissue is present. The picture is almost purely one of chronic prostatitis.

CASE 102.—*Slight enlargement of median and lateral lobes. Considerable pain. Cured. Followed 11 months.*

No. 950. C. M. H., age 52, married, admitted May 25, 1905.

Complaint.—"Enlarged prostate."

No history of gonorrhœa.

Present illness began seven years ago with slight burning in the urethra and frequent urination. The condition gradually grew worse and nine months ago the patient was voiding urine every hour, night and day, and there was severe burning sensation in the urethra. Five months ago urination occurred about every 15 minutes, and he was catheterized by a physician and 15 ounces of urine was withdrawn, after that the catheter was passed several times and his condition improved considerably, but he suffered so much pain in the urethra that he began the use of morphine which he has not used for some time. The patient urinates about every two and one-half hours night and day. There is no hesitation and the stream is large, but there is considerable burning and straining at the end of urination. He has never had hematuria or passed a stone. His sexual powers are impaired. He has not had intercourse for six months, but he still has erections.

Examination.—The patient is thin, emaciated. Mucous membranes are pale. Lungs are negative. The heart is enlarged and a soft, systolic murmur is present at the apex and in the tricuspid area. The abdomen is negative. Inguinal glands are not enlarged. Examination of the blood shows 76% hemoglobin, reds 3,550,000.

Rectal examination.—The prostate is moderately enlarged in both lateral lobes, the left being the larger. It is rounded, smooth, soft, and not tender. The right seminal vesicle is slightly indurated, but the left is soft. No enlarged glands are to be felt.

June 12, 1905.—The patient returns for operation. He has considerable pain in voiding and urinates about every 15 minutes with marked straining. A catheter is passed and 180 cc. cloudy urine is withdrawn.

Urinalysis.—Cloudy, acid. Sp. gr. 1025, albumin a trace. Microscopically, pus cells. He is put on urotropin, 30 grains a day, and instructed to return for catheterization once daily.

June 17.—The patient has improved, but he has been taking morphine in considerable quantity. He suffers greatly from pain in urethra and bladder.

Cystoscopic examination.—A catheter passes with ease and withdraws 250 cc. residual urine. The bladder is very irritable and it is impossible to get its correct capacity. Cystoscope showed two fairly large lateral lobes with a deep sulcus in front and a shallow sulcus behind and a small median bar connecting the two. Both ureters were visible and normal in appearance. The bladder is slightly trabeculated and acutely inflamed. With the finger in the rectum and cystoscope in the urethra the beak can be felt, the trigone is soft, and there is very little increase in the median portion of the prostate. The urine contains pus cells and bacilli in large numbers.

Note.—Following cystoscopy the patient had a rise of temperature to 104°. There was no evidence of pneumonia nor renal infection, but five days later he still had a temperature of 103°, and it was thought probable that the fever was due to absorption from the bladder and operation was therefore performed at once.

Operation, June 21, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were moderately enlarged, soft and easily enucleable. The median portion, which was very small, was removed through the left lateral cavity, a small tear being made in the urethra. The rest of the urethra and ejaculatory ducts were preserved intact. The wound was closed with double drainage tubes for the bladder and the lateral cavities packed lightly with gauze. Continuous irrigation was begun at the operating table, infusion on return to the ward. His pulse remained high throughout the operation, being 135 at the end, but his condition was otherwise good.

Convalescence.—Condition of the patient improved rapidly after the operation. The temperature fell to normal the next morning and remained so after the third day for ten days. The gauze and catheters were removed on the second day. The patient suffered considerable from vesical and urethral irritability and the urine did not begin to flow through the urethra until the 15th day, but the fistula closed completely on the 25th day. On the tenth day epididymitis developed on the left side, and about two weeks later upon the right side. During this time the temperature which had been normal arose and for two weeks varied from 100° to 102.5°, when it again became normal. A week later, however, the fever returned and he continued to have a daily temperature of 103° for several days. The patient was a very weak subject and convalesced poorly. He complained severely of the need of morphine. After August 3 he was free from fever, but did not leave the hospital until August 13, when he was discharged, 49 days after the operation. At that time he was able to maintain his urine from four to five hours, stream was large, a catheter passed with ease and found no residual urine. At times, when moving around, a few drops of urine escaped, but as a rule he had perfect control. Both epididymes were indurated, but neither had gone on to suppuration. His general condition was much improved.

November 30, 1905.—Letter. The perineal wound is closed. I void urine naturally, once or twice at night, four or five times during the day, often as much as a pint at a time, and I consider myself cured. Erections have returned and sexual intercourse is entirely satisfactory. I have gained 35 pounds in weight, and my health is excellent.

May 9, 1906.—Letter. I void urine naturally three or four times a day and once at night, from 12 to 16 ounces at a time. I suffer no pain. Erections and intercourse are entirely satisfactory. My general health has never been better. I have gained in weight, and I consider myself cured.

September 15, 1906.—Letter. I void urine naturally three or four times during the day and once at night, about 10 or 12 ounces at a time. Sexual intercourse is normal and entirely satisfactory. I am entirely cured.

Pathological report.—The specimen, G. U. 171, consists of three pieces of prostatic tissue comprising the three lobes. The total weight is about 18 grams. The left lobe is a lobulated mass, typical of benign hypertrophy and weighs about nine grams. The right lobe is composed of a number of spheroids, elastic in consistency, and weighs about seven grams. The middle lobe is a small, irregular mass, weighing two grams, is much more fibrous than either of the lateral lobes, but a few small spheroids are present. The ejacuatory ducts have not been removed. No calculus present.

Microscopical examination.—The tissue of the lateral lobes contains very little gland tissue, while in the section from the middle lobe there is scarcely any gland tissue at all. In the lateral lobes one finds small areas where there is some gland tissue grouped together in lobules, but the acini are not dilated. The epithelium is cylindrical in type, in places one layer thick, in other ducts part of the wall has an epithelium many layers thick. Throughout the greater part, the gland tissue is atrophied and the ducts are compressed, the epithelium in many instances being entirely absent. Everywhere throughout the section there is marked round cell infiltration with extensive formation of inflammatory tissue. In areas there is a fair amount of muscle tissue present, but in the majority of the areas the fibrous tissue is distinctly more abundant. The middle lobe contains practically no gland tissue, and the ducts, which are present, are for the most part compressed and atrophied. Everywhere very extensive round cell infiltration with formation of new connective tissue is present.

This is a distinctly fibrous type of hypertrophy, the gland and myomatous tissue being comparatively small in amount.

Case 103.—*Moderate hypertrophy of median and lateral lobes. Catheter three months. Cured.*

No. 969. J. S. A., age 61, married, admitted June 22, 1905.

Complaint.—" Prostatic obstruction. Catheterism."

No history of gonorrhœa.

Present illness began seven years ago with frequency, difficult urination and slight pain.

Course of disease.—Gradual increase in frequency and difficulty until March, 1905, when he was urinating every two hours and suffered considerable pain at end of penis. Had no complete retention of urine. Began the use of a catheter three months ago. Since then has used it twice daily, has been free from pain, has never had hematuria, has lost no weight.

S. P.—He catheterizes himself at bedtime, and withdraws about five ounces of residual urine. Does not rise to urinate until 7 a. m. Uses the catheter again at 10 a. m., and voids again at 5 p. m. and again about 8 p. m., passing five or six ounces each time. Suffers no pain, but finds the catheter an " infernal nuisance."

Sexual powers.—Considerably weakened, but is still able to have intercourse. Erections infrequent, but fairly good. General health excellent.

Examination.—Patient is a sturdy looking man. Chest and abdomen negative.

Genitalia.—The corona of the glans penis is congenitally obliterated, owing to adhesion of prepuce to anterior portion and glans at a point 1 cm. distant.

Rectal.—The prostate is moderately hypertrophied, the left lobe being the larger. It is smooth, soft, not tender and contains no nodules. Seminal vesicles are soft. The vasa deferentia are apparently indurated and enlarged, and a prominent septum-like band of fibrous tissue extends from the upper end of the left lateral lobe out to join the pelvis. No enlarged glands are felt.

Urinalysis.—Cloudy, acid, 1022, no albumin, no sugar.. Microscopically, pus cells and bacteria.

Cystoscopic.—Small silk catheter passes with ease, finding 340 cc. residual urine. Bladder capacity is large and tonicity is good. The cystoscope shows very little enlargement of the lateral lobes, but no cleft between them anteriorly. The median portion of the prostate is slightly enlarged with a shallow sulcus between it and the lateral lobes on each side. In front of the median lobe, the lateral lobes are seen to come together and compress the prostatic urethra, both ureters are easily seen, and are apparently normal. The bladder is trabeculated with numerous shallow pouches. There is slight cystitis, no foreign bodies. With finger in rectum and cystoscope in urethra the beak is easily felt, and the thickness in the median portion is only slightly increased.

Operation, June 24, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were moderately enlarged, measuring each about 3 x 4 x 5 cm. The median portion of the prostate was removed through one of the lateral cavities and measured 2 x 2½ x 3 cm. A small tear was made in the urethra, but the ejaculatory ducts were preserved. The rectum was very adherent to the posterior capsule of the prostate, and a small tear was made into it with the finger. After completion of the operation the hole was closed with several layers of fine silk sutures. The levator muscles were drawn together with catgut. The rest of the wound was closed as usual with double catheter drainage and light packs for the lateral cavities. Patient stood the operation well, pulse at the end 75. Infusion and continuous irrigation on return to the ward.

Convalescence.—Patient reacted well, and during the first six days the highest temperature was 100.5°. The irrigation was discontinued after 12 hours, the gauze was removed in 24 hours and the tubes in 48 hours. The urine came through the anterior urethra on the fourth day, and he was able to retain it for two or three hours. The patient was kept on milk diet and the bowels were not moved until seventh day with calomel. The rectal sutures did not break down. Epididymitis set in on the ninth day, and was accompanied by a temperature of 104°, which rapidly fell to normal. After eight days the epididymitis had completely disappeared under treatment with ice. The perineal fistula closed on the 19th day, and the patient was ready to go home, but on July 14 he had a slight fever and phlebitis came on on the left side. For five days the patient had a temperature which reached 101° to 102°, after that it remained practically

normal, but his leg was tender and he was not discharged from the hospital until the 34th day. At that time his condition was excellent, he voided urine freely, at intervals of three hours, the wound was closed, a catheter showed 55 cc. residual urine, and no stricture. The rectal and perineal wounds were tightly closed.

December 30, 1905.—Letter. I void urine once during the night and four times during the day, about 10 ounces at a time, suffer no pain. The wound is closed, I have not been instrumented and I consider myself cured. I have had no erections, but before operation intercourse was very unsatisfactory. My general health is excellent.

May 7, 1906.—Letter. The wound has remained healed. I void urine naturally, only once during the night, and as much as 15 ounces at a time. I have a slight pain at the end of urination and have not had erections. My general health is excellent, and I consider myself cured.

September 14, 1906.—Letter. Urination is normal, three or four times during the day, often not at all during the night, 12 ounces or more in amount. I have erections, but my sexual capacity is weak. I am cured.

Pathological report.—The specimen, G. U. 175, consists of the median, right and left lobes removed in four pieces, the whole forming a small mass which weighs not more than 15 gm. The lateral lobes are about equal in size and measure 3 x 2.5 x 2 cm. The median bar measures 2 x 1 x 1 cm. The surfaces of the lateral lobes are smooth, soft, and on section show the typical picture of adenomatous hypertrophy. Fibrous tissue is more abundant in the right than in the left. The median bar shows glandular tissue with considerable fibrous stroma.

Microscopic examination.—The tissue contains more stroma than glandular elements. The acini occur oftentimes in small aggregations, and there seems only a small tendency to formation of lobules. The stroma is composed mostly of fibrous tissue, the muscular fibers being comparatively few in number. There is a tendency in this hypertrophy towards the fibrous type. There are very numerous corpora amylacea in the culs-de-sac.

CASE 104.—*Anterior lobe, growing out from right lateral. Small median. Three calculi. Cure.*

No. 969. E. G. C., age 55, married, admitted June 22, 1905.

Complaint.—"Enlarged prostate."

Gonorrhœa at the age of 20, mild attack without complication.

Present illness began six years ago with difficulty of urination. The course of the disease was gradual up to January, 1904, when complete retention of urine came on. He was then catheterized for two weeks. Since then has not used a catheter except when urination was unusually difficult.

S. P.—At present voids urine three times during the night, 15 times during the day. Urination painful, but never radiates to end of penis, but sometimes to back. No hematuria. Micturition is slow and difficult. One month ago the residual was 10 ounces.

Sexual powers.—Good. General health excellent.

Examination.—A well nourished man, lips of good color, no arteriosclerosis. Chest and abdomen negative.

Rectal.—Prostate is slightly enlarged, the posterior surface being flat, outlines difficult to make out. It is soft, smooth, not tender, and there are no nodules, seminal vesicles are negative.. The prostatic secretion contains numerous lecithins, moderate number of granule cells and a few pus cells, actively motile spermatozoa.

Urinalysis.—Cloudy, alkaline, sp. gr. 1022, albumin a slight trace, microscopically, pus cells and staphylococci.

Cystoscopic.—A coudé catheter passes with ease. Residual urine 100 cc. bladder capacity 250 cc. The cystoscope shows a small rounded median lobe, very little enlargement of the left lateral lobe, considerable intravesical enlargement of the right lateral lobe which presents upward so

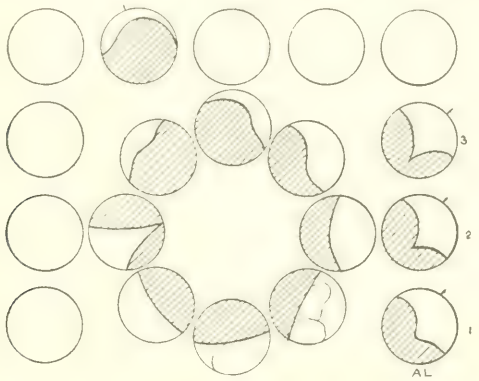


Fig. 48.—Case 104.

that it is seen in front of the urethral orifice as a prominent overhanging mass, as seen in the accompanying cystoscopic pictures, Fig. 48. In the series A. L. with the cystoscope looking upward and to the left, the side of this anterior lobe is seen, and the sulcus is shown to become deeper as the handle of the cystoscope is elevated in No. 2 and 3. In Fig. X. the apex of this anteriorly projecting lobe is seen. This condition is an unusual finding. In R. the deep sulcus between the middle lobe and right lateral lobe is seen. The bladder is slightly trabeculated and contains two calculi, one smaller than the other. With finger in rectum and cystoscope in urethra the median enlargement appeared only moderate.

Operation, June 24, 1905.—Ether. Perineal prostatectomy by the usual technique. Removal of three calculi through the wound after division of lateral wall of the urethra and dilatation of the neck of the bladder. The larger stone measured 3 x 2½ x 2 cm., the others were much smaller. The lateral lobes were only slightly enlarged. The median lobe was small and removed through one of the lateral cavities. The operator had

forgotten the cystoscopic findings and thought the operation was complete, after removal of the calculi the finger was inserted in the bladder and showed at once a prominent overhanging anterior lobe, which had been seen with the cystoscope. It was easily drawn into the right lateral cavity, and enucleated. It was about 2 cm. in diameter. The wound was closed as usual with double tube drainage and slight packs for the lateral cavities. Pulse at the end of the operation was 76. Infusion and continuous irrigation on return to the ward.

Convalescence.—For four days the patient had temperature varying between 99° and 100.7°, after that practically normal. The irrigation was discontinued after 12 hours, and the gauze and tubes were removed within 24 hours.

On the fifth day most of the urine came through the anterior urethra. On the 10th day he had perfect control and very little urine came through the fistula which finally closed on the 18th day. He was up in a chair on the third day, and began to walk on the fourth day. Was discharged on the 26th day, wound closed, voiding urine at intervals of four hours, no incontinence, no pain. General condition excellent, has had no complications. A silver catheter caught in a pouch in the prostatic urethra and no further attempt was made to obtain the residual urine.

Urinalysis.—Acid, slightly cloudy, pus cells and bacilli.

November 30, 1905.—Letter. I void urine naturally, about every three hours during the day and five hours at night. I have had no instrumentation, the wound has remained closed. I sometimes void 10 ounces at a time, have only a slight pain at end of urination. Erections have not returned. My general health is good with the exception of paralysis agitans.

May 8, 1906.—The wound has remained healed. I void urine normally at intervals of four hours during the day. I do not rise at night to urinate. The amount voided is sometimes 12 ounces. I suffer no pain. Do not have erections. My general health is excellent and I consider myself cured.

September 14, 1906.—Letter. I void urine naturally at intervals of three or four hours and not at all at night, 12 ounces in amount. I have erections and intercourse, but imperfectly, owing to lateral curvature of the penis. I consider myself cured.

Pathological report.—The specimen, G. U. 174, consists of three lobes of the prostate removed in four pieces, and weighs G-25. The lateral lobes are about equal in size and measure 4 x 2.5 x 2 cm. and each has been removed in one piece. The outer surfaces are smooth, but the inner surfaces are somewhat torn and lobulated, and there is considerable stroma, and little gland tissue. The median lobe was very small and has been lost. The anterior lobe forms a globular mass about 2 cm. in diameter, and is similar in character to the rest of the prostate. There is no suggestion of malignancy. No mucous membrane, no ejaculatory ducts. Three calculi have been removed as described in the operation.

Microscopic examination.—Section from the left lobe, which ap-

parently macroscopically contains most fibrous tissue, shows on microscopic examination a rather less amount of glandular tissue than normal. The acini are very irregular in outline, and the epithelium is absent from a great number of them. There is no marked dilatation of the ducts although here and there one is seen which is somewhat larger than normal. Many of the ducts are small and compressed. There are quite a number of corpora amylacea seen. The stroma is largely fibrous in character although a fair amount of smooth muscle fibers is present. There are several areas of chronic prostatitis. Prostatitis is evidently of long standing in these areas as there is considerable chronic inflammatory tissue formed, especially periglandular. The areas of prostatitis are comparatively few and small.

The hypertrophy is of the fibro-myomatous type, there being comparatively no glandular increase, and the fibrous tissue predominating.

CASE 105.—*Moderate enlargement of median and lateral lobes. Induration and enlarged glands suggesting cancer. Symptoms not. Perineal enucleation. Cure. Followed 12 months.*

No. 967. H. D. P.,. age 69, married, admitted June 22, 1905.

Complaint.—" Enlarged prostate."

No history of gonorrhœa.

Present illness began 15 years ago with frequency of urination, hesitation and straining. He came then to the hospital where he was irrigated once a day for two weeks with considerable improvement. Urination, however, remained frequent, generally three or four times at night and every two hours during the day, and at times there were attacks of irritability, associated with very frequent urination which was relieved by catheterization and irrigation of the bladder. He has not had complete retention of urine and during the last two years has been unable to pass a catheter to irrigate the bladder. Five weeks ago epididymitis of left side came on. He has never had hematuria nor pronounced pain, and has passed no calculus.

S. P.—The patient voids four times during the night, and about every one and one-half hours during the day. He suffers no pain, no hematuria, no straining, has lost very little weight.

Sexual powers.—Erections present, intercourse fairly normal.

Examination.—The patient is a sparely nourished man, with lips of good color, slight arteriosclerosis. Heart and lungs are negative. Abdomen negative.

Genitalia.—The globus minor of left side is considerably indurated, and there is a varicocele present.

Rectal.—The prostate is moderately enlarged, the left lateral lobe being larger than the right. The surface is smooth, the consistence firmer than normal, but not of stony hardness. It is slightly elastic and not tender. There is slight induration at the junction of the prostate and seminal vesicles on both sides and several firm fibrous cords are felt extending from the middle and upper end of the prostate to the pelvic wall. The out-

lines of the seminal vesicles are difficult to make out and there is no marked induration. There is no intervesicular mass. The outer borders of the seminal vesicles are adherent to the lateral structures on both sides, but not to the rectum which is soft and movable. Several enlarged glands are felt far up on the left side next to the pelvic wall, and in the sacral fossa several small glands are felt. Prostatic secretion contains a few lecithin cells, granule cells, and a moderate number of pus cells.

Urinalysis.—Clear, amber, acid, very few pus cells, and a few short bacilli.

Cystoscopic.—A small coudé catheter passes with ease and finds 25 cc. residual urine and a contracted bladder which will hold only 150 cc. on forced distention. The cystoscope enters easily and is not grasped by the prostatic urethra. It shows a small sessile rounded median lobe with a fairly deep sulcus on each side. The lateral lobes are not at all intravesically enlarged. Both ureters are easily seen and are apparently normal. With finger in rectum and cystoscope in urethra the beak is easily felt, there is no subtrigonal thickening, the median portion of the prostate is considerably enlarged, and the prostate feels quite hard around the cystoscope.

Remark.—The history did not suggest carcinoma, but the finding of enlarged glands and induration, while not of stony hardness, made us suspicious of carcinoma. The cystoscope did not, however, present the picture of carcinoma. It was decided to do the conservative operation on the ground that if the disease was carcinomatous the case was hopeless on account of the involvement of the glands in the sacral fossa.

Operation, June 27, 1905.—Ether. Perineal prostatectomy by the usual technique. The prostate was easily separated from rectum leaving a fairly smooth posterior capsule. Palpation showed considerable induration in both lobes, but in the region of the seminal vesicle there was very little induration. The usual bilateral capsular incisions were made and a thin piece of tissue excised for examination. It had a roughly granular appearance with small white and yellow specks in a fibrous stroma and suggested carcinoma. A frozen section made at once, showed many areas of apparently benign adenomatous hypertrophy, in a few places there were large masses of epithelial cells packed together in spaces of tissue and with no appearance of normal glandular structure. The picture was not typical of carcinoma, but all who saw it thought it was probably malignant. Owing to the presence of enlarged pelvic and sacral glands the radical operation was not attempted. The lateral lobes were easily enucleated, were only moderately enlarged, measuring 3 x 4 x 4 cm. in size. The middle lobe was enucleated through the left lateral cavity, was smooth, round and measured 2 cm. in diameter. The wound was closed as usual with double tube drainage and light gauze packs for the lateral cavities. The patient stood the operation well, pulse at the end being 110. Infusion and irrigation on return to ward.

Convalescence.—The patient reacted well, and had an uninterrupted convalescence, the highest temperature being 100°. The irrigation was discontinued after 12 hours, the gauze and tubes removed at the end of 24 hours. The patient was up in a chair on the second day. Urine came through the anterior urethra on the ninth day, and the perineal fistula closed on the 16th day. On the fourth day the left epididymis, which had been swollen before operation again became enlarged and tender. He was discharged from the hospital on the 29th day, able to retain urine for four hours, with no incontinence but with considerable precipitancy. He was free from pain and the perineal wound tightly healed. Rectal examination showed slight induration in the region of the seminal vesicles, but nothing suggesting carcinoma. A silver catheter passed with ease, no strictures present, no residual urine. Patient advised to take urotropin, drink water in abundance and dilate bladder by retaining urine as long as possible.

November 30, 1905.—Letter. The wound has remained closed, but is somewhat tender. I void urine naturally, about once in two hours, and three to five times at night. Generally three ounces at a time, occasionally four and one-half. I have no pain. No erections. Have had no treatment. Have gained in weight and my health is fairly good.

May 21, 1906.—Letter. I void urine naturally, three times during the night and at intervals of two hours during the day, and about three and one-half ounces at a time. I suffer no pain, my general health is fair. I have gained a little in weight, the wound has remained closed and I consider myself cured.

September 15, 1906.—Letter returned with a report that patient is traveling in Europe and enjoying good health.

Pathological report.—The specimen, G. U. 177, consists of the three lobes of the prostate removed in three pieces, and weighing about G-10. During operation an incision was made through the prostatic capsule, and a piece removed for examination. The cut surface showed many fibrous bands with intervening areas yellowish in color, and it was thought to be suspicious of carcinoma. Yellowish dots were granular, raised above the surface and the intervening tissue was very hard and fibrous. A frozen section showed a very peculiar picture. There was only a small amount of normal gland structure, considerable fibrous stroma with intervening round cell infiltration, and a few areas with peculiar epithelial cells, apparently infiltrating the stroma. This was thought to be carcinoma although the picture was very unusual.

The right lobe of the specimen removed measures 2.5 x 2 x 2 cm., is fairly smooth, encapsulated externally, and internally where incised by the scalpel shows numerous yellowish dots in a fibrous stroma; it does not grit under the knife, but suggests somewhat carcinoma. The left lobe is about 2.5 x 1.5 x 1 cm. in size and is similar to the right. The median lobe measures about 2 cm. in diameter, and on section the yellowish mottling is quite marked. No mucous membrane, no ejaculatory ducts, no calculi.

Microscopic examination.—The section is largely composed of fibrous and smooth muscle tissue. There is very little gland tissue present. Many of the acini are dilated and show intracystic growth. In areas the acini are flattened and giving evidence of compression; some being almost entirely obliterated. In these areas of compressed acini there is considerable fibrous hypoplasia. In one angle of the section there is quite an extensive prostatitis, probably most marked about the acini, but extending over a considerable area in the interstitial tissue. The inflammatory process here gives evidence of long standing as there is considerable fibrous tissue formation. This section is that of a fibro-myoma with comparatively little adenomatous tissue.

Case 106.—*Considerable hypertrophy of lateral lobes. Small median bar. Catheter life. Cured of obstruction. No residual urine present. Frequent urination due to cystitis and vesical contracture. Followed 11 months.*

No. 956. C. K. D., age 64, widowed, admitted June 8, 1905.

Complaint.—" Catheterism."

No history of gonorrhœa.

Present illness began seven years ago with frequency and difficulty of urination, this gradually increased until he was voiding urine every 15 minutes at night, and every hour during the day four years ago. Complete retention of urine then came on and he was catheterized. For the next three years he was catheterized at bed time but was able to void in small amounts. During the past year retention of urine has been complete and the catheter has been necessary.

S. P.—The patient is unable to void and catheterizes himself about six times a day, often with considerable difficulty. He suffers no pain except when the bladder becomes full; no hematuria. He has been unable to have sexual intercourse for two years, but on rare occasions has an erection when the desire to urinate comes on.

Examination.—The patient is well nourished, lips of good color. Chest and abdomen are negative.

Rectal.—The prostate is quite large, apparently about the size of a small orange, smooth, elastic, no areas of induration, no nodules. The upper end is reached with difficulty, and the seminal vesicles cannot be reached.

Cystoscopic.—The retention of urine is complete. The cystoscope shows a median bar and two very large lateral lobes with a deep sulcus in front. There are no sulci between the lateral lobes and the median bar. The bladder is trabeculated and one small diverticulum is seen. No stone present. With finger in rectum and cystoscope in urethra the beak is easily felt and the median portion of prostate is moderately increased.

Urinalysis.—Cloudy, acid, 1030, no albumin, no sugar, microscopically, pus cells and bacteria. Prostatic secretion contains few lecithins, many large granule cells, a few pus cells, no spermatozoa.

Operation, June 30, 1905.—Ether. Perineal prostatectomy by the usual

technique. The lateral lobes which were quite large, were easily enucleated. A small median lobe was enucleated through the left lateral cavity, a slight tear being made in the urethra, but no mucous membrane being removed. The ejaculatory ducts were preserved. The wound was closed as usual with double drainage and light packs for the lateral cavities. Submammary infusion and continuous irrigation on return to the ward. The patient stood the operation well and the pulse at the end was 95.

Convalescence.—The patient reacted well. The irrigation was continued for eight hours, and the gauze and tubes were removed at the end of 24 hours. Considerable bleeding followed this, and a few hours later the urethra became plugged with blood clots so that a catheter had to be passed. The catheter was removed on the following day and there was no more hemorrhage. Interval urination was established immediately after removal of the catheter. On the fourth day urine came through the anterior urethra, but the fistula did not close until the 15th day. On the 17th day the patient complained of pain in the bladder, and he was catheterized, about 150 cc.. urine being withdrawn. He was catheterized again on the following day. The patient had a slight temperature until July 20. The evening rise being between 100 and 100.5° each day. He had no epididymitis or other complications to explain this. He was discharged on the 22d day in good condition, able to retain urine for three hours, and voiding in a free stream with no incontinence. A silver catheter then passed with ease and found 18 cc. residual urine. The bladder was slightly contracted and patient was advised to drink water in abundance and to retain urine as long as possible in order to dilate the bladder.

September 30, 1905.—The patient has enjoyed good health since the operation three months ago, has had no complications and no treatment except urotropin. Urine is voided every two hours during the day and three or four times at night.

Examination.—The urinary stream is large and free, silver catheter meets no obstruction and finds 15 cc. residual urine and the bladder capacity is 360 cc. The wound is closed.

November 30, 1905.—Letter. I void urine naturally and freely, but too frequently viz., about every two hours night and day, about four or six ounces at a time. I have a slight pain just before urinating. The wound is closed and my general health is good. I have had no erections.

May 10, 1906.—Letter. I void naturally but often during the day and night, the largest amount at a time is about two ounces. I suffer pain when I hold my urine too long. I do not have erections. I have had no complications or treatment since operation.

September 12, 1906.—Letter. I void urine naturally, three or four times during the day and once at night, in normal amounts. Erections and sexual intercourse are satisfactory. My general health is splendid and I am entirely cured.

Case 107.—*Moderate hypertrophy of the median and lateral portions of the prostate. Residuum 1150 cc. Nephritis. Operative cure. Later dropsy. Accidental death six months after operation. Followed 10 months.*

No. 983. J. M. M., age 65, married, admitted July 7, 1905.

Complaint.—" Frequency of urination and incontinence."

Gonorrhœa once as a young man.

Present illness began two and one-half years ago with increased frequency of urination. His condition gradually grew worse until one year ago he began to dribble and would void every half hour night and day. Four months ago he had considerable hematuria, no pain, no gravel. Six weeks ago a catheter was passed and one quart of urine withdrawn.

S. P.—Urine is voided about every half hour during the day and seven or eight times at night in small quantities. There is considerable precipitancy, never any hesitation. During the night there is almost constant dribbling. His appetite has not been good and he has lost 27 pounds.

Sexual powers.—Has not had erections for two years.

Examination.—Patient looks well and his lips are of good color. The pulse is full, regular, and there is very little arteriosclerosis.

Genitalia.—Negative.

Rectal.—The prostate is only slightly enlarged, smooth, fairly soft at apex, slightly indurated at the base particularly on the left side. The left seminal vesicle is indurated slightly and there is a small nodule at its junction with the prostate. The right seminal vesicle and vas are not indurated. There is nowhere induration of marked degree, no enlarged glands, no intravesicular mass and the posterior wall of the bladder feels soft.

Cystoscopic.—A coudé catheter passes with ease and finds 1150 cc. residual urine. The cystoscope shows a moderate intravesical enlargement of the lateral lobes and a slightly rounded median lobe with a shallow sulcus on each side. The ureters are easily seen and appear normal. The bladder is trabeculated; there is a slight cystitis, no calculus. With finger in rectum and cystoscope in urethra the trigone feels soft, the median portion of the prostate is slightly increased.

Urinalysis.—Cloudy, alkaline, 1006, albumin a trace, no sugar, microscopically, pus cells and a few casts. Urea G-16 to liter. Total solids G-23 to the liter.

Preliminary treatment.—The patient was sent to the hospital and catheterized two or three times daily. He was able to void a small amount, but the catheter frequently withdrew 800 or 900 cc. residual urine, and on the day before operation 1100 cc. Catheterization produced considerable urethral irritation, but the patient's condition improved, the sp. gr. increased from 1006 to 1010, but the granular casts and moderate amount of albumin were still present.

Operation, July 21, 1905.—Ether. Perineal prostatectomy by the usual technique. Both lateral lobes were moderately enlarged and easily enucleated. A median lobe of moderate size, a part of which was suburethral,

was removed through one of the lateral cavities without removing any of the urethra or vesical mucosa. Two small linear tears were made, but the floor of the urethra and ejaculatory ducts were preserved intact. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. The patient stood the operation well, but his pulse was quite rapid, being 140 at the end and 156 on return to the ward. Infusion and continuous irrigation on return to ward. Two hours after the operation the pulse was 100 and the patient's condition excellent. The gauze was removed on the day after the operation, the irrigation was discontinued on the second day and the tubes removed on the fourth day. There was no post-operative rise of temperature. The patient was up on the sixth day. Urine began to flow through the anterior urethra on the 13th day, the patient was able to retain urine for four or five hours, and his condition was good. He was discharged from the hospital on the 40th day. The fistula was not quite closed, but practically all of the urine came through the urethra in a large stream, at intervals of four hours without pain or hesitation. There was a slight terminal dribbling but no incontinence. Silver catheter meets no obstruction and finds 75 cc. residual urine.

October 14, 1905.—The fistula persists, but only a few drops come through it. He voids urine freely without pain, at intervals of three or four hours. Gets up only twice at night.

November 30, 1905.—Letter. I void urine naturally, but it comes with little force. The largest amount at one time is four ounces. I urinate three times during the day and four or five times during the night. The fistula is still open and about one-half ounce comes through each time. There is a burning and scalding during urination.

December 28, 1905.—I am very weak, my breathing is short, I am dropsical, my stomach and feet are very much swollen. I have lost my appetite, my kidneys are not doing their duty. The fistula is still open.

January 27, 1906.—My condition is very bad and I am confined to my room, I am dropsical, my feet and scrotum are swollen, and I measure 47 inches around my bladder. My wound has not closed yet, a portion of the urine still comes through it.

February 19, 1906.—The patient was killed to-day by being thrown out of a buggy.

Pathological report.—The specimen, G. U. 182, consists of the three lobes of the prostate removed in four pieces. The lobes were not labeled and it is impossible to say what the pieces represent. The entire weight is about G-20, and the entire mass measures about 5 x 3 x 3 cm., more than half of it being in one piece. The surface is fairly smooth, and on section shows considerable gland tissue and a small amount of stroma. No induration nor suggestion of malignancy. No ejaculatory ducts, no mucous membrane.

Microscopic examination.—Section from the large lobe. In this section the gland tissue is very abundant, and arranged mostly

in lobules. The acini within the lobules are only slightly dilated, but there is considerable papillomatous outgrowth in the lumina of the ducts. The stroma within the lobules consists mostly of slender bands interlacing between the various acini. The epithelium lining the acini is of a cylindrical type sometimes one layer deep, and in other places growing out in epithelial tufts many layers deep. One sees occasionally a few leucocytes in the lumina of the acini with occasional areas of round cell and polynuclear cell infiltration in the stroma. Occasionally one sees an acinus which is considerably dilated, and the epithelium is considerably flattened. The stroma is composed of smooth muscle and connective tissue; the smooth muscle fibers apparently being largely concentrically arranged about the acini while the center of the stroma is largely connective tissue. The stroma in the glandular areas seems for the most part loosely bound together, but is much more dense in the less glandular areas.

This is a section of a distinctly adenomatous type of hypertrophy with some glandular dilatation, and a stroma composed about equally of muscle fibers and connective tissue. Some mild chronic prostatitis present, evidently of not very long standing as in the areas of infiltration there is no formation of inflammatory tissue.

CASE 108.—*Considerable enlargement of median and lateral lobes. Catheter life for nine years. Cure.*

No. 163. J. M. C., age 68, married, admitted July 5, 1905.

Complaint.—" Prostatic hypertrophy. Catheterism."

No history of gonorrhœa.

Present illness began 13 years ago with difficulty in urination. This gradually increased until complete retention of urine came on nine years ago, and since then patient has led a catheter life. On September 19, 1901, a Bottini operation was performed under cocaine. Only one cut was made owing to the breaking down of the transformer. The patient was unable to void after the operation and nine days later a second attempt was made to perform a Bottini operation, but again the apparatus failed to work. After that the patient continued to lead a catheter life, but has been able to void voluntarily a few drops of urine.

S. P.—Catheterization four to six times daily, very little voluntary urination, no pain in rectum, bladder or perineum. He suffers from recurrent epididymitis brought on by the use of the catheter.

Sexual powers.—Satisfactory.

Examination.—The patient is a healthy looking man, with lips of good color. The lungs are slightly emphysematous and the heart is somewhat enlarged, but otherwise negative. The abdomen is negative.

Genitalia.—The right globus major is indurated and enlarged and there is a varicocele of moderate size on the left side and the epididymis is slightly indurated.

Rectal.—The prostate is considerably enlarged, about the size of a small

orange, smooth, rounded, elastic, no tenderness, no nodules, no marked induration. There is a slight induration of the seminal vesicles, no enlarged glands are to be felt. The prostatic secretion is composed almost entirely of pus cells.

Cystoscopic.—The catheter passes with ease, there is complete retention of urine, the bladder is large. The cystoscope shows a very large median lobe, a portion of which is directed downward and backward and lies upon the trigone obscuring the right ureter. It is covered by rough granular, in places papillary mucous membrane, and at first suggested an intravesical tumor, but its connection with the median lobe was easily made out and the bladder around seemed perfectly healthy. The lateral lobes are moderately intravesically enlarged. The bladder is markedly trabeculated with numerous intervening pouches. There is considerable cystitis, but no calculus. With finger in rectum and cystoscope in urethra the beak cannot be felt owing to the great length of the prostate and the considerable size of the median portion.

Urinalysis.—Cloudy, acid, 1020, no sugar, albumin in considerable amount. Microscopically, pus cells and a few casts and bacilli.

Operation, July 24, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were of considerable size but were easily enucleated. The median lobe was very large measuring about 5 cm. in diameter. It was removed through the right lateral cavity, a small portion of the mucous membrane covering it was very adherent to it, and was removed with it. A small tear was also made in the urethra but none was removed and the ejaculatory ducts were preserved. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. Patient stood the operation well, his pulse at the end being 80. Infusion and continuous irrigation on return to the ward.

Convalescence.—The patient reacted well, but on the day after the operation the temperature rose to 104.3°. The pulse, however, was only 100° and after four days the temperature remained normal. The irrigation continued for 18 hours, the gauze was removed in 24 hours and the tubes in 48 hours. The patient was out of bed in a week. The urine came through the anterior urethra on the seventh day, and on the 12th day he was able to hold urine for four hours. The perineal fistula closed on the 16th day and the patient was discharged from the hospital on the 19th day, the wound healed, and voiding urine without pain or dribbling, at intervals of from two to five hours. General condition excellent. A silver catheter passed with ease and showed no obstruction or stricture, no residual urine.

November 30, 1905.—Letter. The wound has remained closed, I void urine naturally at intervals of four to five hours night and day, in normal amounts. I suffer no pain, have had no erections as yet. My general health is excellent.

May 1, 1906.—The patient voids urine at intervals of six hours. Does not void during the night. There is no incontinence and no pain. Erections have returned but are still weak. The urine is almost clear.

Pathological report.—The specimen, G. U. 184, consists of three lobes of the prostate each removed in one piece and weighs about G-55. The lateral lobes are about equal in size and measure 3.5 x 2.5 x 2.5 cm.; they are fairly smooth, encapsulated, slightly lobulated and on section show considerable glandular tissue and also considerable amount of stroma. There is no dilatation of the ducts. The middle lobe is larger than the two lateral combined and measures 6 x 4.5 x 4 cm. It is irregularly torn and a small area of mucous membrane is attached to it. On section there is apparently more gland tissue than in the lateral lobes. No ejaculatory ducts, no calculi present.

Microscopic examination.—Section from the right lobe shows tissue in which there is a large amount of stroma. Here and there are areas in which the gland tissue is fairly abundant. The acini, as a rule, are small, and even in places compressed, although occasionally one sees an acinus which is considerably dilated, with convolutions of its lining wall. There is quite marked evidence of chronic inflammation in the stroma with considerable formation of areas of inflammatory tissue. This new tissue is often concentrically arranged about the acini and interlacing in different directions through the interstitial stroma. About a few of the acini there is considerable round and polynuclear cell infiltration with quite numerous leucocytes in the lumina of the acini. There is quite a fair amount of smooth muscle present in the stroma, but the connective tissue would seem to predominate.

This section is a fibro-myo-adenoma in which the adenomatous tissue is only moderate in amount, the tissue being to a large extent composed of stroma in which the connective tissue predominates.

Case 109.—*Very large hypertrophy of median and lateral lobes. Desperate condition before operation. Uremia. Operation to supply perineal drainage. Continuation of uremia. Death twenty-seventh day.*

No. 992. J. S. O., age 73, widowed, admitted July 20, 1905.

Complaint.—"Prostatic enlargement. Catheter life."

No history of gonorrhœa.

Present illness.—About 10 years ago the patient began to have great difficulty in urination which increased for two years when he began the use of a catheter and has been unable to void since. He has suffered greatly with pain in the back but has not lost much weight. Of late he has had great difficulty in passing his catheter and has suffered a great deal and become very weak.

S. P.—He is now being catheterized by his physician two or three times daily. He is very weak and sick.

Examination.—The patient looks sick, has been quite prostrated by his trip. His lips are of fair color and pulse 80, volume good, slight nodular arteriosclerosis. The heart, lungs, and abdomen are negative. There is tenderness over the kidneys which are not palpable.

Genitalia.—Left epididymis is considerably indurated. The glands in both groins are enlarged.

Rectal.—The prostate is considerably enlarged, the left lobe being the greater. The contour is rounded, in places a little irregular, elastic, fairly soft, except at the upper end of right lobe where it is slightly indurated, and continuous with a small indurated mass which runs off towards the pelvis. Neither seminal vesicle is palpable and there is no intervesicular mass. The patient is unable to void urine. A coudè catheter passes easily and finds 500 cc. of urine. The patient is too sick for cystoscopic examination and is sent to the hospital for preliminary treatment.

July 23, 1905.—The patient has been catheterized three times a day. The total amount of urine to-day was 1050 cc. Sp. gr. 1005, albumin considerable, urea G-14 per liter. The patient has been drowsy and often very irrational and difficult to manage. To-day he had a severe chill, temperature of 102.6°. The patient seems to be going down and operation seems advisable to supply better drainage.

Operation, July 24, 1905.—Ether. Perineal prostatectomy by the usual technique. The prostate was enormous. Two very large lateral lobes were removed with ease, each in one piece, Fig. 49. The median lobe, which projected at least three inches into the bladder was removed in two pieces, one through each lateral cavity. The mucous membrane was very adherent to it, and a small portion was removed. There was very little hemorrhage and the patient stood the operation well. The wound was closed with double tube drainage and light packs for the lateral cavities as usual. A submammary infusion was given on the table and continuous irrigation on return to the ward.

Convalescence.—The patient reacted well from the operation, had no rise of temperature and the highest pulse during the next 24 hours was 94. A second infusion was given during the night, considerable urine was secreted. About two hours after the operation the patient pulled out the tubes, and they were inserted again with difficulty.

July 26, 1905.—The temperature has ranged between 97° and 100°, the pulse between 67 and 80. His general condition is good, he has taken much water and voided considerable urine, but his mental condition is bad and not at all improved. Patient is up in a wheel chair to-day and the tubes have been withdrawn.

August 1, 1905.—The patient has been up in a wheel chair daily. His condition improved for a while, but to-day he is more stupid. Plenty of urine is voided through the perineal wound, and he has drank considerable water and been infused every other day. His temperature has varied between 80° and 100.5° and his pulse between 65 and 85.

August 6, 1905.—Since last note the patient has been irrational, extremely restless, has refused everything by mouth. He has been fed through a stomach tube and infused twice daily (too often). His temperature has risen slightly, was 102° last night. His general condition is growing worse.

August 13, 1905.—The patient has been fed through a stomach tube two or three times a day and given two infusions daily. Large quantities of urine are passed through the perineal wound which is clean and healing

nicely. His mental condition is bad, at times very stupid. He has had Cheyne-Stokes respirations for one week, and his temperature has varied between 100° and 103°, has not been over 100.5° during the past three days.

August 16, 1905.—Patient has not been infused for several days. He has refused nourishment and has been fed through the stomach tube three



FIG. 49.—Large coalescent median and lateral lobes. Case 109.

times a day. For the past two days there has been a marked œdema of the hands and feet. He has been very stupid and it has been almost impossible to arouse him. Temperature this morning 104.3°.

August 17, 1905.—The patient grew steadily worse. Respirations were bad, and at 4.30 this morning he died. No autopsy could be obtained.

Pathological report.—The specimen, G. U. 183, consists of five pieces, and weighs about G-150. The lateral lobes have each been removed in two pieces, the smaller portion in each case being intravesical. The right lateral lobe (two pieces together) forms a mass about 7 x 4 x 3.5 cm., is

fairly smooth, and on section shows numerous spheroids and a small amount of connective tissue. The left lateral lobe is larger, measuring about 9 x 6 x 4 cm., but is similar in character. The median lobe is the largest and measures 9 x 5 x 4 cm., and has been removed in one piece, it is similar in character to the other lobes. No ejaculatory ducts, no calculus.

Microscopic examination.—The stroma and gland tissue are present in about equal proportions, the gland tissue being somewhat more abundant than stroma, especially in the areas of lobulation, while outside of the lobules the gland tissue and stroma are about equal in proportion. Within the lobules the ducts are considerably dilated, the stroma in many instances being but thin bands interlacing between the various acini. In the areas outside of the lobules the gland ducts are about normal in size with comparatively regular lumina. There is some round cell and polynuclear cell interstitial infiltration, with formation about many of the acini of a fair amount of new connective tissue. The stroma is made up in varying proportions of muscle fibers and connective tissue, the latter in many areas predominating. This is a rather adenomatous type of hypertrophy with a fair amount of stroma and a moderate amount of interstitial and peri-glandular inflammatory tissue formation.

Case 110.—*Moderate hypertrophy of median and lateral lobes. Complete retention two weeks. Cure.*

No. 1114. C. M. F., age 76, married, seen in Buffalo, N. Y., August 1, 1905.

Complaint.—"Complete retention of urine. Catheterism."

No history of gonorrhœa.

Present illness began three years ago with frequency and difficulty of urination. This gradually increased until two months ago, when retention of urine became complete, but after 24 hours he was able to void without catheterization. During the past month he has had to urinate three or four times every night, and incontinence has been present. His only pain has been an occasional one in the epigastrium. A second retention of urine came on one week ago, and since then he has required catheterization three or four times daily. The patient suffers considerable pain during catheterization. Sexual powers absent for some time.

Examination.—The patient is a robust looking man with lips of good color. The heart and lungs are negative. The abdomen is large, and there is considerable over-fatness.

Rectal.—The prostate is moderately hypertrophied, forming a soft, rounded bulging mass, not tender on pressure. There is no induration in the region of the seminal vesicles.

Cystoscopic.—A coudé silk catheter passes with ease and finds about 500 cc. residual urine. Introduction of the cystoscope was followed by considerable hemorrhage, and it was impossible to determine the condition of the intravesical portion of the prostate or to see whether a stone was present.

Urinalysis.—Acid, cloudy, microscopically, pus cells and bacilli. Urea in good amount. No evidence of poor renal function.

Operation, August 2, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were enucleated and measured each 5 x 4 x 3 cm. The median lobe was removed through one of the lateral cavities and measured 3 x 3 x 2 cm. The ejaculatory ducts were preserved and only a slight tear was made in the urethra. Examination showed no stone in the bladder and that the prostatic enlargement had been completely removed. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. The patient was given an infusion during the operation and continuous vesical irrigation afterward. The amount of hemorrhage was slight and his condition was excellent at the end.

Convalescence.—The patient reacted well. Continuous irrigation was maintained for 12 hours, and the gauze was removed on the day after the operation, and the tubes on the next day. On the third day the patient was in excellent condition, propped up in bed, suffering very little pain. I then left Buffalo.

Letter.—The highest temperature after the operation was 101°. Fourteen days after the operation epididymitis set in and delayed his convalescence. The perineal fistula closed on the 42d day. The patient was out-of-doors in four weeks, voiding urine naturally at intervals of about two hours. On October 6 the other testicle began to swell, this followed the passage of sounds through the urethra.

February 19, 1906.—The wound has remained closed, I void urine naturally once during the night and every three hours during the day, about six ounces at a time. I suffer no pain, do not have erections. My general health is good, and I consider myself cured.

May 8, 1906.—Letter. I think I am entirely cured. I void urine naturally about five times during the day and about once or twice at night. During the day when the desire to urinate comes on I must attend to it at once or there may be a slight leakage. I have never wet the bed at night. I suffer no pain. Erections which were absent before operation have not returned. My health is good. I could not be much better at my age.

Pathological report.—The specimen, G. U. 204, consists of the three lateral lobes of the prostate removed each in one piece, and weighs in all about 40 gm. The lateral lobes are about equal in size, encapsulated, coarsely lobulated, and on section show considerable gland tissue and little stroma, the picture in places being rather homogeneous, in others showing considerable spheroid formation. Some of these spheroids are quite yellow in color, and have dilated acini. The median portion of the prostate measures 3 x 3 x 1.5 cm., and has apparently more stroma than the lateral lobes, which measure each about 4 x 4 x 2.3 cm. No mucous membrane, no ejaculatory ducts present, no calculi.

Microscopic examination.—Microscopically the hypertrophy is a moderately glandular one, the gland tissue at times being arranged in spher-

ical lobules, at other times it is rather diffuse. In the spherical lobule the gland tissue is distinctly in excess of the stroma, but in the areas outside, the gland tissue and stroma are present in varying proportions. The alveoli are, as a whole, moderately dilated, although there are many areas where the alveoli are rather small. The usual complexity of acini noticed in these cases is also present, and corpora amylacea are seen. The stroma contains more fibrous than muscle tissue, and throughout the various portions of the gland there is seen considerable round cell infiltration of the stroma together with formation of a fair amount of inflammatory tissue interlacing in different directions.

CASE 111.—*Moderate hypertrophy of median and lateral lobes. Catheter life. Residual urine 600 cc. Cured. Followed 10 months.*

No. 933. S. L., age 65, married, admitted May 15, 1905.

Complaint.—"Frequency of urination and dribbling at night."

No history of gonorrhœa.

Present illness began two years ago with frequency of urination, but no difficulty and no pain. Since then there has been a gradual increase in the frequency and four months ago patient consulted a physician who passed a sound and gave him medicinal treatment without relief. Incontinence of urine has been present at night for the past three months.

S. P.—The patient voids urine every hour during the day and three or four times at night, and, despite this, wets the bed almost every night. The patient voids urine in very large amounts without hesitation, no pain and with very little difficulty. His general health is fairly good, but he feels uncomfortable in his abdomen.

Sexual powers.—Has no sexual power. Imperfect erections in the morning.

Examination.—The patient is well nourished with lips of good color. The lungs are negative. There is a soft presystolic murmur at apex and systolic and diastolic murmur at aortic area. Pulse is good. Slight arteriosclerosis. Abdomen is negative with the exception of a distended bladder.

Genitalia.—There is a large varicocele with an atrophic testicle on the left side.

Rectal.—The prostate is moderately hypertrophied, globular, smooth, soft, no nodules, no induration in region of the seminal vesicles, no tenderness, rectal mucosa soft, no glands present.

Cystoscopic.—A coudé catheter passes with ease and finds 600 cc. residual urine. The cystoscope shows a fairly large median lobe with a sulcus on each side. The lateral lobes are very little intravesically hypertrophied. The bladder is markedly trabeculated with numerous pouches and one fairly large diverticulum on the right side. No cystitis, no calculus.

Subsequent treatment.—The patient was given urotropin and advised to go into the hospital at once, but would not consent. Complete retention of urine came on during the night, following cystoscopy and catheterization was necessary. After that he was catheterized once more and left the city, promising to return for operation. After that he did not have

complete retention, but urination became gradually more frequent, and he had considerable irritation along the urethra. After May, on account of the difficulty of urination, he began using a catheter at first three times a week and recently twice daily. His general health remained good. On August 9, 1905, he returned for operation.

Urinalysis.—Cloudy, 1010, acid, no sugar, trace of albumin, numerous pus cells, no casts. Urea 15 gm. to the liter.

Operation, August 14, 1904.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were only moderately enlarged, being about 4 cm. in diameter and rather firmly adherent. A pedunculated middle lobe of moderate size was removed through one of the lateral cavities along with a small area of mucous membrane which was attached to it. Closure as usual. The patient stood the operation well. Pulse at end 90. Infusion and continuous irrigation on return to ward.

Convalescence.—The patient convalesced well. The highest temperature 100.7° on the day following the operation, after that practically normal. Continuous irrigation was discontinued after 12 hours, gauze removed in 24 hours and the tubes in 48. The patient was up on the third day, in excellent condition. The urine came through the anterior urethra on the 12th day, and the fistula closed on the 16th day. He was discharged on the 36th day in excellent condition, able to retain urine four or five hours with no dribbling, perfect control, stream large, no pain.

Urine.—Sp. gr. 1010, pus cells, cocci, no casts. A catheter passed with ease and found no residual urine.

November 30, 1905.—Letter. The wound has remained closed. I void urine naturally every three or four hours during the day and twice at night in large quantity without pain or irritation. My general health is excellent, and I consider myself cured. Have had no erections.

February 12, 1906.—The patient says he feels well, voids urine at normal intervals, gets up once at night, has no pain and feels perfectly well. Urine is still cloudy and contains bacteria.

March 10, 1906.—The patient reports for examination. Wound has remained closed, and he has had no treatment except urotropin since operation. He drinks water in considerable amount and voids large quantities of urine at intervals of four hours night and day. (Arising at 2 and 6 a. m. to urinate.) He has no pain or irritation. Has had no erections. His general health is excellent.

May 8, 1906.—I void urine naturally at intervals of four hours during the day and at 2 a. m. and 6 a. m. at night. I suffer no pain. I do not have erections. My general health is fairly good. I have gained 11 pounds since the operation. The wound has remained healed, and I consider myself cured.

September 15, 1906.—Patient reports that he is perfectly well and enjoying good health.

Pathological report.—The specimen, G. U. 206, consists of five pieces, comprising both lateral and middle lobes. Total weight about 18 gm. It is

soft and elastic in consistence and on section is made up of numerous spheroids. The ejaculatory ducts have not been removed. No calculus present.

Microscopic examination.—The hypertrophy is a lobulated, moderately glandular one. Some of the acini are dilated with quite extensive intra-acinous proliferation. The epithelium lining the acini is often many layers thick, and the lumina are frequently filled with degenerated epithelial cells. The stroma shows some polynuclear and round cell infiltration with, in areas, marked periacinous inflammatory tissue formation. There is a considerable amount of muscle present in the stroma. The arteries show quite marked thickening, especially in the fibrous areas.

CASE 112.—*Moderate hypertrophy of median and lateral lobes. Cured. Followed seven months.*

No. 1021. J. R. R., age 71, single, admitted September 24, 1905.

Complaint.—"Catheterism. Prostatic trouble."

No history of gonorrhœa.

Present illness began 10 years ago with slight difficulty and frequency of urination. Condition remained about the same until one year ago when complete retention of urine came on, after which he was catheterized for two weeks. After that frequent and difficult urination. During the past month the patient has been catheterized twice daily.

S. P.—About five hours after catheterization the patient is able to void urine in small amount and afterwards every hour with great difficulty until catheterized. His only pain is in the bladder when it becomes full, no hematuria, no gravel, has not lost weight. Sexual powers normal.

Examination.—The patient is well nourished with lips of good color. The arteries are slightly thickened, but his pulse is good. Chest, abdomen and genitalia are negative.

Rectal.—The prostate is considerably and equilaterally enlarged, about the size of a small orange. It is slightly irregular, generally soft, in places slightly indurated. There is no induration in the region of the seminal glands or between them, and there are no glands to be felt. Prostate is not tender.

Cystoscopic.—A catheter passes with ease and finds 170 cc. residual urine. The bladder is irritable and contracted and retaining only 200 cc. The cystoscope shows a fairly large median lobe with slight intravesical lateral hypertrophy. There is a deep sulcus on each side of the middle lobe. Both ureteral orifices are apparently normal, the bladder is slightly trabeculated, considerably inflamed, there is no stone present. With finger in rectum and cystoscope in urethra, there is no subtrigonal induration, and the tissues beneath the cystoscope in the median portion are only moderately increased (cystoscope probably in the lateral cleft).

Urinalysis.—Cloudy, acid, 1020, albumin in small amount, no sugar. Pus cells and bacteria numerous.

Operation, September 25, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were easily enucleated and measured

about 2 x 3 x 5 cm. in size. The middle lobe was extracted in one piece with the right lateral lobe by means of the tractor and measured 3 x 4 x 5 cm. in size. A portion of the urethra on the right side was torn and removed. The floor of the urethra and ejaculatory ducts were preserved intact. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. The patient stood the operation well, pulse at the end 112. Submammary infusion and continuous irrigation on return to the ward.

Convalescence.—The patient reacted well, but had more fever than usual, viz., 102° on the second and third days, between 99° and 100° for the next 12 days, and between 101° and 102° for a week. He was very comfortable, however, and his condition was good and there was no explanation for the late rise in temperature. There were no epididymitis or other complications. The irrigation continued for 12 hours, the gauze was removed on the day after the operation and the tubes on the following day. On the third day the patient was up, urine came through the anterior urethra shortly after the removal of the tubes, and the perineal fistula closed finally on the 18th day. Interval urination was established early, but there was slight incontinence for three weeks. The patient was discharged from the hospital on the 31st day. At that time he could retain urine for five hours, voided in a large stream without hesitation, was free from pain and had had several firm erections. The wound was found healed, a silver catheter met no obstruction, residual urine 5 cc. Urine still contained pus and a small amount of albumin.

November 30, 1905.—Letter. The wound has remained closed, and I void urine as freely as I ever did, three or four times during the day and once or twice at night, often a pint at a time. I have no pain and consider myself cured. I do not have erections. My general health is good.

May 7, 1906.—Letter. I void urine as naturally as I ever did and a pint or more at a time. I suffer no pain, I have some erections, but not as satisfactory as before operation. My general health is very good. I have gained in weight, and I consider myself cured.

September 13, 1906.—Letter. I void urine naturally three or four times during the day and none at night, about a pint at a time. Erections have returned. General health excellent. I am cured.

Pathological report.—The specimen, G. U. 186, consists of two pieces and weighs about 32 gm. The right lateral and median lobes have been removed in one piece, and are about equal in size, each measuring 4 x 3 x 2.5 cm. in size. They are formed of many spheroids more or less loosely bound together. The section shows the usual adenomatous picture with considerable fibrous stroma in the median portion. The left lobe measures 5 x 3 x 2 cm.; it is similar in appearance, but apparently more glandular than the rest of the prostate. Portion of the mucous membrane has been removed with the left lateral lobe.

Microscopic examination.—All three lobes present microscopically the same picture. The alveoli are for the most part arranged in lobules, and the gland tissue is very much in excess of the stroma. There is con-

siderable cystic degeneration present in areas, while in others there is only moderate dilatation with rather marked invagination and complexity of the gland lumina, with papillomatous outgrowth. There seems to be marked glandular proliferation going on. The stroma in many areas is insignificant in amount, comprising but slender bands of muscular and fibrous tissue. In other portions, especially surrounding the lobules, the stroma is much more evident. Here and there small areas of interstitial and occasionally periacinous polynuclear and round cell infiltration are seen.

The hypertrophy is of the glandular type with slight cystic degeneration and considerable gland proliferation.

CASE 113.—*Considerable hypertrophy, particularly of left lobe, with induration, pain and other symptoms suggesting cancer. Cure. Followed nine months.*

No. 1325. H. H. M., age 64, married, admitted September 5, 1905.

Complaint.—"Prostatic trouble."

No history of gonorrhœa.

Present illness began with slight frequency of urination four years ago, but he had very little trouble until three and one-half years ago when complete retention of urine came on, and he had to be catheterized for three weeks. One year later he was again unable to void and has had to use a catheter ever since. He is able to pass small amounts, but with great difficulty, straining, pain and burning along the entire urethra and at times in the thighs and testicles. Hematuria has been considerable at times and patient has found catheter life very disagreeable.

S. P.—The patient catheterized himself without regard to asepsis two or three times during the day and once or twice at night. Micturition is very painful and difficult. Erections have not been present for five years. Both testicles have been swollen.

Examination.—The patient is well nourished, mucous membranes of good color. The lungs, heart and abdomen are negative.

Rectal.—The prostate is considerably enlarged, particularly in the left lateral lobe which extends far upward in the region of the seminal vesicle, but the contour is oval, the surface smooth. In places it is slightly indurated, in others soft. The seminal vesicle cannot be palpated, but two small cordlike masses are felt extending upward and outward from its upper portion. The right lateral lobe is only moderately hypertrophied, smooth, elastic, and does not extend upward into the region of the seminal vesicle, which is not indurated. Both lobes are distinctly more tender than usual. The rectum is not adherent and no enlarged glands are to be felt.

Cystoscopic.—The catheter passes with ease. Retention of urine is complete. Vesical capacity is somewhat contracted. The cystoscope shows a moderate enlargement of the left lateral lobe, greater enlargement of the right lateral lobe and a median bar of moderate size continuous with the right lateral lobe, but separated from the left by a fairly deep sulcus.

The mucous membrane covering the prostate is smooth. The trigone and ureters are easily seen. The bladder wall is markedly trabeculated, and two small diverticula are present. Considerable inflammation is present. No foreign body. With finger in rectum and cystoscope in urethra there is no increase in the subtrigonal tissues and the median portion of the prostate is only moderately thickened.

Urinalysis.—Cloudy, alkaline, 1019, no sugar, albumin a trace, urea 8 gm. to liter. Total quantity in 24 hours 1500 cc. Microscopically, numerous pus cells.

Operation, September 6, 1905.—Ether. Perineal prostatectomy by the usual technique. The right lateral lobe was only moderately enlarged, the left was much larger and projected well up into the region of the seminal vesicle. It was smooth, rounded, encapsulated and easily enucleated.

The urethra, ejaculatory bridge and bladder were not disturbed. Frozen sections of the left lateral lobe during the operation showed benign adenoma. The wound was closed as usual. Submammary infusion and continuous irrigation on return to the ward. Patient stood the operation well, the pulse being 95 at the end.

Convalescence.—The temperature rose to 101.1° on the day after the operation, and for a week there was a temperature every evening between 100° and 101°. The patient was comfortable and had an excellent convalescence. Continuous irrigation was discontinued after 12 hours, gauze was removed 24 hours without bleeding, tubes in 30 hours. Urine began to come through the anterior urethra on the second day. The patient was up in a chair on the third day and walking on the fifth. The perineal fistula closed on the ninth day, and he was discharged from the hospital on the twelfth day. His condition was excellent, urination every three to four hours with no incontinence, good stream, only a slight burning at times. He had had one erection after the operation.

November 30, 1905.—Letter. The wound has remained healed. I void urine as well as I ever could, about four or five times during the day and two or three times at night, often a pint at a time. I have no pain and think I am cured. I do not have erections, have had no complications, no treatment, have gained 10 pounds, and I feel like a two-year-old.

May 7, 1906.—Letter. Urination is entirely normal. I void twice during the night, almost a pint at a time. I have no pain nor erections. Have had no complications nor treatment. My general health is good, I am gaining in weight and strength, and consider myself entirely cured.

CASE 114.—*Considerable enlargement of median and lateral lobes. Large stone seen with cystoscope, but not found at operation. Result: Relief of obstruction, frequency of urination and pain. Examination eight months later. Stone seen and removed by suprapubic lithotomy.*

No. 1025. E. S., age 70, widowed, admitted September 8, 1905.

Complaint.—" Enlarged prostate, catheterism."

No history of gonorrhœa.

Present illness began three years ago with marked precipitancy and fre-

quency of urination during the day. Very soon after his physician was called, passed a catheter and drew off over two quarts of urine, since then patient has not voided and has used a catheter. He has never had hematuria, never passed gravel. His only pain has been an occasional sharp pain at the neck of the bladder and in the rectum during defecation.

S. P.—He catheterizes himself about every six hours. Cannot void at all, occasionally has slight pain in the bladder.

Sexual powers.—No erections for one year. General health fairly good.

Examination.—The patient is emaciated, lips of good color, pulse regular, but considerable arteriosclerosis is present. The heart, lungs and abdomen are negative. The glands of both groins are enlarged, indurated but discreet.

Genitalia.—The left epididymis is slightly indurated and enlarged. There is a varicocele present.

Rectal.—Prostate is moderately enlarged, somewhat irregular in shape, particularly along the outer border of the right lateral lobe where a large hard nodule can be felt. At the upper end of this lobe is an indurated mass one and one-half cm. wide, extending upward and outward into the region of the seminal vesicle for a distance of about 2 cm. It is hard, smooth and not tender, and no indurated cords are to be felt above it. The seminal vesicles cannot be made out. The left lateral lobe is larger than the right and regular in contour. Its consistence is elastic, and although it extends farther upward than the right lobe, there is no prolongation into the region of the seminal vesicle, which is soft. In the intravesicular region nothing abnormal is made out. No enlarged glands can be felt in the sacral fossa or left side of the pelvis. On the right lateral wall of the pelvis one hard gland is felt about 2 cm. above the induration of the prostate. The rectal wall is soft and not adherent.

Cystoscopic.—A No. 17 coudé catheter passes with ease. There is no roughness in the posterior urethra and the catheter is not grasped. Retention of urine is complete and the bladder capacity is small, admitting only 150 cc. The cystoscope shows a considerable enlargement of both lateral lobes with a deep sulcus between them anteriorly, and a median lobe of moderate size with a deep sulcus between it and the left lateral lobe. Behind the median portion of the prostate is a long, oval, white, slightly granular calculus, freely movable in the bladder. When the patient is turned to the left side it rolls into the left half of the bladder (see cystoscopic chart, Case XV, "Use of Cystoscope, etc."). The bladder is considerably trabeculated and inflamed, and considerable mucus is present. With the finger in the rectum and cystoscope in the urethra the subtrigonal tissues are apparently not much increased. To the right of the cystoscope the oval induration continuous with the right lateral lobe is felt. This induration is not of stony hardness and is smooth in contour. The median portion is moderately increased.

Operation, September 11, 1905.—Ether. Perineal prostatectomy by the usual technique. The posterior surface of the prostate was smooth and not of stony hardness and did not suggest carcinoma. The lateral lobes

were quite large and easily enucleated. On section they appear benign and a frozen section shows benign adenoma. At the upper end of the right lateral lobe a small oval lobule was found separately encapsulated and distinct from the main body of the right lateral lobe. It was evidently a lobule which had broken through the capsule at this point and projected into the region of the seminal vesicle, the frozen section showed it to be benign. The middle lobe was enucleated through the right lateral cavity without tearing the urethra or the mucous membrane of the bladder. The lateral walls of the urethra were very adherent to the lateral lobes and a portion was removed on each side. Every effort was made to find the calculus which had been seen with the cystoscope, forceps, spoons and searchers were used, but it could not be detected. The operator, convinced that he had mistaken a mass of mucous for a stone, finally desisted and closed the wound, as usual, with double tube drainage and light packs for the lateral cavities. The patient stood the operation well. Pulse at the end 100. Submammary infusion and continuous irrigation on return to the ward.

Convalescence.—The patient reacted well, the temperature rose to 103.6° five hours after the operation, but rapidly fell, rose to 100.8° the next day and after that remained practically normal. Continuous irrigation was discontinued after 12 hours, the gauze was removed in 24 hours and the tubes in 48 hours. For two days the urine came entirely through the wound, the patient having no control. On the fourth day it began to flow through the anterior urethra in small, but rapidly increasing amounts. The patient was up on the third day and left the hospital on the 14th day in excellent condition. The perineal fistula was not completely closed. Urine was voided about every three hours in a large stream, there was considerable urgency of urination but no incontinence. He was free from pain and had no complications. A silver catheter passed with ease, meeting no obstruction, found 40 cc. residual urine, bladder capacity of 230 cc. Careful search failed to detect a calculus. The urine was acid, quite purulent. The patient was advised to take urotropin and to distend bladder by retaining urine as long as possible, and to return in a month for cystoscopic examination.

November 30, 1905.—Letter. The fistula finally closed on 35th day. The wound is firmly closed, I void urine naturally, but frequently, about every two hours during the night, and every time I get up after sitting down during the day. I only pass about one-quarter pint at a time and have considerable pain during urination. My general health is excellent, and I have gained considerably in weight.

May 8, 1906.—Letter. I void urine about every hour during the day. I suffer a great deal of pain during urination, particularly in walking down hill. At night I use the catheter three times, and have about three hours rest between catheterization. I have had no erections since the operation. My general health is good and I have gained 20 pounds. I am benefited, but not cured.

May 19, 1906.— The patient returns for examination. The wound has

remained closed, but he still voids urine at intervals of an hour and with pain. He catheterizes himself at bedtime, and is then able to sleep for three or four hours. Has had no erections since operation.

Examination.—The patient looks well.

Rectal.—In the region of the prostate is a small cicatrix, no evidence of remaining hypertrophy.

Cystoscopic.—The catheter passes with ease and finds 60 cc. residual urine. The bladder is small and irritable and will retain only 160 cc. The cystoscope shows a large, oval, white vesical calculus free in the vesical cavity. The bladder is trabeculated, no diverticula seen. Study of the prostatic orifice shows a somewhat irregular margin, and in the median portion a small tentlike fold of mucous membrane. There is no definite enlargement present. With the finger in rectum and cystoscope in urethra there is no enlargement of the median portion made out.

May 22, 1906.—Operation. Ether. Suprapubic lithotomy. A large soft calculus about 4 x 6 x 3 cm. in size was removed. Examination of the bladder showed no remaining calculus. The wall contained a few cellules, but the stone was not encysted. Examination of the prostatic orifice showed a smooth mucous membrane, no intravesical lobes, a small transverse fold in the median portion about 1 cm. high and 7 mm. thick. The prostatic orifice was large and apparently no obstruction was present. It was thought easy, however, to excise this median fold and it was caught between two clamps and excised. A piece of tissue about 1 cm. in diameter being removed. The bladder was drained suprapubically through a large rubber tube which was fastened in place. The patient stood the operation well. Pulse at the end 85. Infusion on return to the ward. The temperature arose to 100.8° on the second day and the patient was nauseated and hiccoughed frequently. The suprapubic tube was removed on the third day and the patient was up in a wheel-chair on the sixth day. On the 10th day a catheter was inserted into the urethra with the hope of closing the suprapubic fistula. On the 12th day the urine was still coming through the suprapubic fistula, but the patient asked to be discharged to save expense.

June 9, 1906.—Eighteenth day. The urine comes through the suprapubic fistula. The patient is comfortable, but finds the suprapubic dressings generally wet and disagreeable. He is in good condition and leaves for home to-day.

September 14, 1906.—Letter. I void urine naturally at intervals of from two to three hours, about a gill at a time. I have no pain. My general health is good and I feel that I am cured.

Pathological report.—The specimen, G. U. 187, consists of the three lobes of the prostate which have been removed in four pieces and weighs about 80 gm. The right lobe measures 5 x 4.5 x 3.5 cm. Adherent to it is a small area of urethral mucous membrane. It is firm, but elastic and shows considerable gland tissue and little stroma on section. The left lateral lobe measures 6 x 4.5 x 2 cm., is lobulated, elastic, and on section shows considerable gland tissue separated by a fibrous stroma. The middle lobe meas-

ures 3.5 x 2 x 1.5 cm., is covered by a smooth capsule, is elastic and glandular in character. A small round lobe 1.5 cm. in diameter, which projected beyond the capsule at the upper end of the right lobe is smooth and on section presents an adenomatous appearance. Frozen section from this at operation showed benign adenoma.

Microscopic examination.—Sections from all three lobes show a very glandular tissue. The acini are for the most part very much dilated and lined with somewhat flattened epithelium. In occasional areas the acini are very slightly, if at all dilated, but the lumina are very irregular in outline. Many of the smaller acini show proliferation of the epithelium, often growing out in solid tufts into the lumen. The stroma is comparatively small in amount, fairly compact and made up in fairly equal amounts of muscle and fibrous tissue. It is an adenomatous type of hypertrophy with considerable cystic degeneration, and rather small amount of stroma.

Case 115.—*Considerable hypertrophy of median and lateral lobes. Small calculus. Cure. Followed seven months.*

No. 1082. W. H. P., age 65, married, admitted October 21, 1905.

Complaint.—" Retention of urine."

No history of gonorrhœa.

Present illness began eight months ago with frequency of urination. Several months later began to have pain during urination and sometimes a burning at the end of the penis. Occasionally there was considerable dribbling after urination. Six days ago complete retention of urination requiring catheterization came on, and since then he has been catheterized every six or seven hours. Sexual powers have been considerably weakened since onset of trouble, but intercourse is still possible.

Examination.—The patient is a sturdy looking man with lips of good color.

Heart.—Enlarged and there is a soft blowing systolic murmur at apex. The lungs and abdomen are negative. Genitalia negative, with the exception of a profuse urethral discharge which contains pus cells and cocci, mostly round. (This has been present only since catheterization.) Arteries are sclerotic.

Rectal.—The prostate is considerably hypertrophied, forming a mass which projects well toward the rectum. It is smooth, rounded, elastic, seminal vesicles are palpable but not indurated. There is very little tenderness, no enlarged glands.

Urinalysis.—Cloudy, acid, 1024, trace of albumin, no sugar, no casts, very little pus.

Cystoscopic.—A coudé catheter passes with ease and finds 460 cc. residual urine. The cystoscope shows considerable enlargement of both lateral lobes with a deep cleft between them anteriorly and a fairly large median bar which is continuous with the lateral lobes on each side without intervening sulci. The bladder wall is moderately trabeculated, with shallow pouches and no definite diverticula. Very little cystitis. A very

small oval, dark brown, moderately rough calculus is present behind the interureteral bar. The ureters are visible, and apparently normal. With finger in rectum and cystoscope in urethra the beak can be felt, there is no subtrigonal thickening. The median portion is thicker than normal and the prostatic length is greatly increased.

Preliminary treatment.—The patient remained in the hospital for two days and was catheterized at intervals of from four to six hours. The residual urine varied from 300 to 500 cc. A few hours after catheterization the patient begins to pass water with considerable straining and in small quantities. Urotropin and water in abundance prescribed.

Operation, October 2, 1905.—Ether. Perineal prostatectomy by the usual technique. Lithotomy. The lateral lobes were considerably enlarged, but easily enucleated. A fairly large median bar was easily removed through the right lateral cavity. The floor of the urethra and ejaculatory ducts were preserved intact, no mucous membrane was removed. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. The calculus was not found, although a prolonged search was made. Patient stood the operation well, pulse at the end being 120. Infusion and continuous irrigation on return to ward.

Convalescence.—Patient reacted well. Temperature rose to 100.8° on the day after the operation, but after that was normal. Continuous irrigation was stopped after 18 hours. Gauze was removed in 24 hours, and tubes in 48. The patient was up on the third day. At the end of the week almost all of the urine came through the penis, and the fistula finally closed on the 15th day. Patient was discharged on the 16th day, voiding at intervals of three to four hours, good stream without pain, with no incontinence. General condition excellent. It is possible that the little calculus was removed in a clot of blood and not detected.

December 1, 1905.—Letter. I am getting along very well. The wound has remained healed and urine comes as freely as when I was a boy. I am gaining in flesh and strength.

February 17, 1906.—Letter. The wound has remained closed. I void urine three times during the day and twice at night, sometimes a pint at a time. I suffer no pain, have had no complications, have not had erections. My general health is not good on account of my stomach.

May 7, 1906.—Letter. I void urine naturally at normal intervals during the day and about once at night, and one pint at a time. I have no pain, no erections. My general health is excellent and I consider myself cured.

September 13, 1906.—Letter. I void urine naturally three or four times during the day and once at night. I suffer no pain. Erections and intercourse are fairly satisfactory but somewhat weakened. General health good, am cured.

Pathological report.—The specimen, G. U. 191, consists of three lobes of the prostate removed in four pieces, and weighs about 40 gm. The right lateral lobe is lobulated, 3 x 2 x 1.5 cm. The cut surface is irregular, owing to the protrusion of yellowish lobules with trabeculated fibrous stroma intervening. One small encapsulated abscess is seen. The left lobe con-

sists of two pieces, and measures in all about 4 x 2 x 2 cm. A small piece of mucous membrane is attached to it. On section it is similar to the right lobe. The median lobe is an irregular mass, 2.5 x 2 x 1 cm. It is soft, elastic, and on section is granular with considerable fibrous stroma. No ejaculatory ducts.

Microscopic examination of the *left lateral lobe.*—The section contains a fair sized lobule which is rich in gland tissue. The stroma between the acini is fairly thick, and is composed about equally of muscle and connective tissue. The epithelial lining of most of the acini shows a reduplication and folding, in places assuming a papillomatous type Many of the acini are moderately dilated. Towards the periphery of the lobule some of the acini show a periacinous round cell infiltration. The tissue outside of the lobule contains comparatively few tubules. Some of the tubules are dilated, while there are other areas where the acini are compressed and undergoing atrophy. The stroma is composed of smooth muscle fibers of considerable extent, but in many areas the connective tissue hyperplasia is very abundant. There is considerable round cell infiltration. The connective tissue hyperplasia is especially marked about the acini which are compressed. This section may be called a fibro-myo-adenoma, the adenomatous tissue predominating in areas; and a fibro-myoma in other portions.

Right lateral.—The adenomatous tissue predominates in this section. Many of the ducts are dilated and the lining epithelium is flattened, in other dilated ducts there is some papillomatous outgrowth. The stroma is apparently composed about equally of muscle and connective tissue. In a few limited areas there is some chronic prostatitis present, the infiltration being most marked about the acini and also extending somewhat into the interstitial tissue. In this section the adenomatous tissue distinctly predominates.

The middle lobe.—The tissue here distinctly contains more stroma than the lateral lobes. Many of the acini are quite markedly dilated with flattened epithelium, in other acini there are some solid masses of epithelial cells growing into the lumina of the acini. In areas there has been considerable connective tissue hyperplasia which has almost completely replaced the acini. Here and there is well marked round cell infiltration in the stroma. In this section the fibrous tissue is more abundant, and there is comparatively small amount of gland tissue present except in limited areas.

Case 116.—*Previous suprapubic prostatectomy. Considerable enlargement of the left lateral lobe. Vesical calculi. Cured. Followed eight months.*

No. 1160. H. J., age 65, married, admitted October 6, 1905.

Complaint.—" Frequency and painful urination."

No history of gonorrhœa.

Present illness began about two and one-half years ago with frequent and difficult urination. During the next year he suffered considerably

from straining during urination, and 16 months ago complete retention of urine came on. All attempts to catheterize him were unsuccessful, and he was aspirated suprapubically for five days, when a suprapubic cystotomy was performed for drainage. Two months later a suprapubic prostatectomy was performed in Canada. His convalescence was slow, he suffered with phlebitis and epididymitis, but ultimately left the hospital in good condition, and has not required catheterization since. Urination has been frequent and for the last two months there has been considerable pain in the neck of the bladder and radiating to the end of the penis.

S. P.—Urine is voided every hour during the day and three times at night. The act is painful, the pain radiating to the end of the penis.

Sexual powers.—Has had no erections since suprapubic prostatectomy.

Examination.—The patient is a well nourished man with lips of good color, no arteriosclerosis. The chest is negative, and the abdomen also with the exception of a small suprapubic scar.

Genitalia.—No epididymitis, no hernia.

Rectal.—There is a definite prostatic enlargement present, particularly of the left lateral lobe, the upper end of which is difficult to reach. The right lateral lobe is definitely enlarged. The general contour of the prostate is round, surface smooth, consistence elastic, and fairly soft. The seminal vesicles are negative and no enlarged glands to be felt.

Urinalysis.—Cloudy, 1021, acid, no sugar, trace of albumin, pus cells, no casts seen.

Cystoscopic.—A coudé catheter passes with ease and finds a small amount of residual urine. The bladder capacity is somewhat contracted and very irritable. The cystoscope shows a fairly considerable intravesical enlargement of the prostate consisting of a large left lateral lobe, a small right lateral lobe, and a small median bar connecting the two without intervening sulci. The bladder was trabeculated, inflamed, and in a pouch immediately behind the median portion of the prostate five small oval calculi are seen. With finger in rectum and cystoscope in urethra there is a definite enlargement in the median portion of the prostate.

Operation, October 6, 1905.—Ether. Perineal prostatectomy by the usual technique. The right lateral lobe of the prostate was very small, about 2½ cm. in diameter. The left lateral lobe was considerably enlarged, and after its removal another large lobe, probably the intravesical portion of the left lateral lobe was removed. At first it seemed that this was a middle lobe about 5 cm. in diameter. Exploration with the finger then showed no remaining prostatic hypertrophy. The lateral wall of the urethra was then incised longitudinally, a stone forceps inserted and several small, soft, round calculi and some detritus and fragments were removed. Careful examination with forceps and spoon show no remaining fragments. The wound was closed as usual with double catheter drainage tubes and light gauze packs for the lateral cavities. Patient stood the operation well, his temperature at the end being 85. Infusion and continuous irrigation on return to ward.

Convalescence.—The patient reacted well, but on the day following the

operation the temperature rose to 102.4°; after the third day it remained practically normal. The continuous irrigation was discontinued after 16 hours, the gauze removed after 24 hours and the tubes after 48 hours. On the second day the patient complained of a slight dull pain in the left testicle. There was no swelling and the pain disappeared after two days. The urine continued to come entirely through the perineal wound until the 14th day, when after urethral irrigation some urine came through the anterior urethra. On the 18th day the perineal fistula closed completely. The patient was discharged on the 21st day, in good condition, voiding at intervals of two or three hours with a good stream and only a slight burning.

December 26, 1905.—The patient has had no instrumentation since operation. He urinates without hesitation and in a large stream, at intervals of three hours during the day and five hours at night. He has perfect control, no incontinence of any sort, the wound is healed. A catheter passes with ease, meets no stricture or other evidence of obstruction, and finds no residual urine. Urine still contains pus cells and bacilli.

March 8, 1906.—The patient urinates about every three hours during the day and once or twice at night, usually with a good full stream, but occasionally rather small.

Examination.—The patient voids with a good stream. Urine is almost clear. A silver catheter passes with ease ,and finds 5 cc. residual urine. Bladder capacity 250 cc. A Kollmann dilator passes into the bladder with ease and is dilated up to 35 F.; there is no stricture present.

March 22, 1906.—The patient thinks urination is more free since dilatation. He is able to retain urine seven hours at night and has no incontinence, but during the day when the desire comes on it is imperative, and if patient is very much fatigued a few drops may escape involuntarily.

May 15, 1906.—Letter. I void urine naturally, about six times during the day and once at night, about four or five ounces at a time. I have only occasionally a slight pain. I have erections and satisfactory sexual intercourse, my general health is improving. I have gained in weight and consider myself cured.

September 25, 1906.—Letter. I void urine naturally six or seven times during the day and once or twice at night, in normal amounts. I suffer no pain. Sexual intercourse is satisfactory. I am cured.

Pathological report.—The specimen, G. U. 290, consists of three pieces representing right, left and median lobes and weighs about 25 gm. The left lateral measures 5 x 4 x 3 cm., surface is lobulated, consistency somewhat firm but elastic. On section it is seen that the tissue is made up of lobules of varying size separated by small denser bands of tissue. The right lateral lobe measures 3 x 2 x 1.5 cm. and is similar in character to the left. The median lobe is a somewhat rounded mass measuring 2.5 x 2 cm., and is also made up of lobules.

Microscopic examination.—The hypertrophy is a glandular one with considerable cystic dilatation of the acini in certain lobules. In areas the acini show considerable intraacinous budding. About the periphery of

the lobule there is the usual condensation and compression of acini. In some lobules the acini are rather regular in outline, while in others the acini are serrated and present evidence of activity. The stroma is fairly compact, and contains a moderate amount of muscle. Some few areas of prostatitis are present, but these are comparatively insignificant. The arteries show very little change from the normal.

CASE 117.—*Moderate hypertrophy of median and lateral lobes. Considerable pain. Cure.*

No. 1073. C. K., age 75, married, admitted October 21, 1905.

Complaint.—"Enlarged prostate."

No history of gonorrhœa.

Present illness began 18 months ago with slight increase in frequency of urination. A little later he had pain in the urethra during urination, but soon recovered from both these symptoms. Four months ago he had chills and fever, of malarial character, associated with frequent, difficult and painful urination, during which he was catheterized, and since then he has had gradually increasing difficulty. He has had no pain in the region of the kidneys, no nausea or vomiting.

S. P.—Urination occurs about every half to one hour. The stream is small, urination difficult and slow and accompanied by pain, no hemorrhage.

Sexual powers.—No note made.

Examination.—The patient is well nourished, but looks weak and his lips are pale. The heart is slightly enlarged, but the sounds are clear. The lungs are negative. The pulse is of good volume and tension. There is slight arteriosclerosis. The abdomen is negative.

Genitalia.—Complete inguinal hernia on right side well retained by truss.

Rectal.—The prostate is considerably enlarged, rounded, smooth, soft, and slightly tender. There is no induration in the region of the seminal vesicles nor in the intervesicular space. No enlarged glands.

Urinalysis.—Cloudy, slightly alkaline, 1014, albumin in moderate amount, no sugar. Microscopically, pus cells, no casts seen.

Cystoscopic.—A coudé catheter passes with ease and finds 80 cc. residual urine, bladder capacity of 200 cc. and considerable irritability. The cystoscope shows a small sessile rounded median lobe. The lateral lobes are very little enlarged intravesically, and there are no clefts between them in front. The bladder is considerably trabeculated with numerous small pouches and cellules. The ureters cannot be seen.

Preliminary treatment.—The patient remained in the hospital six days before operation, during which he was catheterized three times daily, the residual urine varying from 150 to 400 cc. Catheterization was very painful and the bladder very irritable. Catheterization afforded very little relief and he frequently voided, every half hour night and day.

Operation, October 27, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were easily enucleated and measured

4 x 5 x 6 cm. in size. The median lobe was about 2 cm. in diameter and came away in one piece with the lateral lobe. A tear was made in the urethra on each side, but the floor and ejaculatory bridge were preserved. Frozen section showed the benign nature of the hypertrophy. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. The patient stood the operation well, the pulse at the end being 100. Infusion and continuous irrigation in ward.

Convalescence.—The patient reacted well. On the day before the operation he had a temperature of 101.7°, on the day after the operation his temperature rose to 101.8°, and on the third day to 102.8°, but it rapidly returned to normal and remained so during the rest of his stay in the hospital. The irrigation was discontinued after 12 hours, the gauze was removed at the end of 24 hours and the tubes 48 hours. Patient was up in a chair on the third day, his general condition excellent. Urine passed through the penis on the ninth day and the perineal fistula closed completely on the 14th day. At that time he was able to retain urine for three hours and voided urine in a good stream and had perfect control. He was discharged from the hospital on the 18th day, voiding urine at intervals of from two to four hours without pain, in a good stream. The catheter passed easily and showed no residual urine. His general health excellent.

May 9, 1906.—Letter. I void urine naturally at normal intervals during the day and once at night, a pint at a time. I have no pain, no incontinence, no erections. My general health is good and I consider myself cured.

September 15, 1906.—Letter. I void urine naturally at intervals of three or four hours during the day and once at night, one pint at a time. No pain, no erections. My general health is good. Cured.

Pathological report.—The specimen, G. U. 189, consists of the middle and two lateral lobes of the prostate and weighs about 35 gm. The left lateral lobe is a lobulated elastic mass, measuring 4 x 3.5 x 3 cm. Attached to it is a small bit of urethral mucous membrane. On section it has a somewhat granular appearance with yellowish areas in a whiter, more fibrous stroma. The median lobe has been removed in one piece with the right lateral, and measures 4 x 3 x 2 cm. in size. The right lateral is about the same size as the left and also has a tag of mucous membrane attached to it. On section it appears to be more fibrous than the right. No calculi, no ejaculatory ducts.

Microscopic examination.—The tissue is of much the same character in all three lobes, being almost entirely composed of stroma. Here and there are seen occasional acini, some of which seem fairly normal, while about others there has been considerable connective tissue formation with compression and at times almost complete disappearance of the acini. The stroma is for the most part smooth muscle fibers with a very small amount of interlacing connective tissue, except in the limited areas about acini where an excess in the connective tissue elements is present. The arteries show rather a marked endarteritis.

This is a hypertrophy in which the muscular element predominates, bundles of pure muscle fiber often being present, and in which the fibrous tissue is comparatively small in amount except in areas as above stated.

CASE 118.—*Considerable hypertrophy of median and lateral lobes. Complication: Epididymitis slight. Cure.*

No. 1080. L. T. D., age 70, married, admitted October 30, 1905.

Complaint.—"Frequency of urination."

No history of gonorrhœa.

Present illness began about two years ago with dribbling after urination. No new symptoms developed until six months ago when the frequency of urination rapidly increased.

S. P.—The patient urinates every hour and there is considerable dribbling, requiring the use of absorbent dressings. His only pain is a slight burning pain near the end of the penis and in the neck of the bladder on urination. There seems to be little difficulty of urination and only some hesitation in starting the flow. There has never been complete retention of urine.

Sexual powers began to decline about 12 months ago, no intercourse for four months, no erections for two months. His general health has been good.

Examination.—The patient is a sparely built but healthy looking man with lips of good color and only moderate arteriosclerosis. The lungs are negative.

Heart.—There is a soft systolic murmur at the base, but the heart is not enlarged.

Genitalia.—The left epididymis is enlarged, irregularly indurated. The right vas deferens and epididymis are indurated, but smooth and not tender.

Rectal.—The prostate is moderately and equilaterally enlarged. The posterior surface is flat, elastic, in places firmer than others, but nowhere of stony induration. The contour is slightly irregular, but generally of an oval shape. The seminal vesicles are negative and there is no intervesicular mass. One enlarged gland is felt along the lateral pelvic wall. The inguinal and deep iliac glands are not palpable.

Cystoscopic.—A large coudé catheter passes with ease and finds 660 cc. residual urine. The cystoscope shows a broad median bar continuous without intervening sulci with large intravesical lateral lobes, the right being the larger. The cleft in front between these lobes is wide and the lobes are not closely approximated (possibly accounting for the dribbling). The bladder is moderately trabeculated, very slightly inflamed. Numerous pouches and small cellules are present. The left ureter is seen and is apparently normal. The right ureter cannot be seen, owing to numerous pouches in the region of its orifice. With finger in rectum and cystoscope in urethra, it is impossible to feel the beak, owing to the considerable increase in the median portion.

Urinalysis.—Cloudy, acid. 1003, no sugar, albumin in small amount. Microscopically, pus cells and bacilli. Urea 8 gm. to liter.

Preliminary treatment.—Catheterization three times daily, urotropin, water in abundance. Before catheterization the bladder forms a definite abdominal tumor, and the patient voids urine in small amounts. From 200 to 400 cc. of residual urine was found.

Operation, November 2, 1905.—Ether. Perineal prostatectomy by the usual technique. As soon as the bilateral capsular incisions were made numerous seed calculi were encountered. The lateral lobes were quite adherent, firm, only moderately enlarged, and each was removed in one piece. The median lobe about 3 cm. in diameter was removed through one of the lateral cavities, a small piece of mucous membrane being excised with it. Most of the urethra, including the floor of the urethra and ducts, preserved intact. Wound was closed as usual with double tube drainage and light packs for the lateral cavities. The patient stood the operation well. Pulse at the end 80. Infusion and continuous irrigation on return to the ward.

Convalescence.—The patient reacted well. The temperature rose to 101° on the day after the operation, and after that varied from 99° to 100°. The irrigation was discontinued after 12 hours, and the gauze and tubes removed 30 hours after the operation. The patient was out of bed on the third day. On the 12th day the right side epididymitis began and two days later the temperature rose to 104.2°, and the patient complained of nausea and headache. He was infused and on the next day the temperature was normal and remained practically so thereafter. The epididymitis was slight in character and disappeared after six days. The urine began to flow through the anterior urethra on the 14th day, and the perineal fistula was apparently closed on the 18th, but after two days slight leakage again occurred. Discharged 23 days after the operation in excellent condition. Voiding urine at intervals of two to three hours without pain. Pin point fistula present in perineum. Epididymitis gone.

February 27, 1906.—Letter. The wound has remained healed. I void urine naturally, three times during the day and once or twice at night, three or four ounces at a time. I have had no erections. My general health is very good, I have gained in weight and consider myself cured.

May 7, 1906.—Letter. I void urine naturally, three times during the day and twice at night, about half a pint at a time. I suffer no pain, the wound has remained healed, my general health is excellent. I have no erections. I consider myself perfectly cured.

Pathological report.—The specimen, G. U. 193, consists of three lobes of the prostate, each removed in one piece and weighs about 30 gm. The left lobe measures 3 x 2 x 1.5 cm., is lobulated, elastic, and on section numerous small seed-like calculi are seen in the substance of the gland; these vary in size from a small grain of sand to a millet seed, and 50 are seen in a section through the center of the gland. The tissue is yellowish in color with streaks of grayish fibrous tissue between. The right lobe is slightly smaller than the left, lobulated and soft. At its upper end there is a small portion of tissue which is distinctly firmer, and on section is hemorrhagic and granular. Frozen sections were made from this during

operation and it showed much fibrous tissue with inflammatory infiltration. A small piece of mucous membrane is attached to the inner surface of the right lobe. The middle lobe is irregular, and about 3 cm. in diameter. The surface is lobulated, and on its anterior aspect is a piece of mucous membrane 2 x 1 cm. in size. Ejaculatory ducts are not present.

Microscopic examination.—The tissue from all three lobes as a whole contains gland tissue considerably in excess of stroma. The glands are arranged somewhat in lobules about which the stroma is somewhat thickened and compact. Within the lobules the acini are moderately dilated with rather flattened epithelium and a thin stroma, while in others the ducts are not dilated, the stroma is considerably more evident and the lumina of the ducts quite irregular. In the interlobular tissue the acini are compressed and rather infrequent. In several good-sized areas from the right lobe there is considerable inflammatory interstitial infiltration, evidently of long standing in places, as there is considerable new connective tissue formation. The stroma, as a whole, contains more fibrous than muscle tissue. This is an adenomatous type of hypertrophy with moderate cystic degeneration, and some chronic interstitial prostatitis.

Case 119.—*Slight enlargement of median and lateral lobes. Catheter life. Occasional incontinence and severe pains in legs. Perineal prostatectomy. Removal of obstruction. Natural urination at night. Incontinence (partial) in the day. Followed seven months.*

No. 1091. H. N. H., age 55, married, admitted November 4, 1905.

Complaint.—"Prostatic enlargement. Catheterism."

Gonorrhœa 36 years ago—was perfectly cured.

Present illness began about two years ago with a feeling of pressure in the bladder and occasional incontinence of urine. He was examined by a physician who diagnosed prostatic hypertrophy. Following this he had inflammation of the bladder, very difficult urination and has had to use a catheter, although retention of urine has never been complete. He has never had any pain in the bladder other than a slight one, has not lost weight. Severe lightning pains in legs for two years.

S. P.—The catheter is used three times a day, withdrawing usually 12 ounces of urine. Retention of urine is generally complete, but occasionally he may void small amounts while at stool. The catheter life is extremely disagreeable to him.

Sexual powers.—His desire is practically gone, has erections at night when the bladder becomes full and occasionally has intercourse, but it is very unsatisfactory.

Examination.—Patient is a strong, well nourished man with lips of good color. The chest and abdomen are negative. The pulse is intermittent, but the volume and tension are good. Moderate arteriosclerosis.

Rectal.—The prostate is only slightly hypertrophied, smooth, regular, elastic, but fairly firm. There are no nodules. The lobes extend somewhat into the region of the seminal vesicles, and there is considerable in-

duration at this point, but it is not prominent and does not suggest malignancy. No enlarged glands are felt and there is no tenderness.

Urinalysis.—Cloudy, 1012, neutral, no sugar, albumin a trace. Microscopically, pus cells, red blood corpuscles.

Cystoscopic.—The retention of urine is complete. A coudé catheter passes with ease and finds the bladder large. The cystoscope shows a moderate hypertrophy of both lateral lobes with a shallow sulcus between them in front, connected by a thin median bar. On depressing the handle of the cystoscope with the beak looking downward the lateral lobes come together forming a deep cleft, behind which only a small portion of the median bar is seen. On the left side a second lobule is seen projecting into the urethra external to the lobule which appears at the prostatic orifice, so that it is distinctly intraurethral. The bladder is considerably trabeculated, moderately inflamed, no calculus present. The ureteral orifices are normal. With the finger in the rectum and cystoscope in the urethra the beak is easily felt, there is no subtrigonal induration, no increase in the median portion.

Operation, November 9, 1905.—Ether. Perineal prostatectomy by the usual technique. Lateral lobes were only slightly enlarged, hard and adherent. A small median bar was enucleated along with the right lateral lobe. There was no definite middle lobe present as shown by insertion of the finger through the urethra. Small tear was made in the urethra, but the ejaculatory ducts and floor of the urethra were preserved intact. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. The patient stood the operation well. His pulse at the end was 110. Infusion and continuous irrigation on return to the ward.

Convalescence.—The patient reacted well. On the second night after the operation the temperature arose to 101.5°, but immediately fell and remained practically normal. The irrigation was discontinued after 28 hours and the gauze and tubes after 40 hours. On the third day he had several attacks of pain in the bladder and urethra which were relieved by urethral irrigation, several clots being dislodged from the wound. No subsequent discomfort. On the third day the patient was up in a wheelchair and in six days was walking about the ward. On the fifth day all the urine came through the anterior urethra, but subsequently the perineal wound opened again. The perineal fistula closed on the 14th day, and the patient was discharged on the 18th day. He was then able to retain urine for six hours, and had no nocturnal incontinence. During the day there was a slight incontinence. No epididymitis. The wound was closed. A silver catheter passed without meeting any obstruction and found no residual urine. The urine was acid and contained pus cells. He was instructed to take urotropin and to drink water in abundance and to retain the urine as long as possible.

February 20, 1906.—The patient returns for examination, complaining of incontinence of urine. He says that he has had no retention of urine since the operation, and no pain, but he is unable to retain urine more

than an hour or so when involuntary leakage begins. While walking about there is almost constant dribbling of urine. During the night he does not get up to urinate and has no incontinence. When he arises in the morning he voids a large amount of urine in a good stream. He has had no sharp shooting pains in the front of thighs which were present before operation.

Rectal.—In the region of the prostate is a small moderately indurated mass, but no prostatic enlargement. A silver catheter passes with ease. No stricture present, no residual urine. The bladder capacity is large—380 cc. The tonicity is excellent.

The cystoscope shows a dilated irregular prostatic orifice so that in places there is no well defined margin. The urethra is apparently dilated, thrown into folds. No intravesical prostatic hypertrophy is seen, but several irregular protrusions of the urethral mucous membrane, possibly small spheroid prostatic masses, are seen in the interior of the urethra. There is no median lobe or bar present, and with finger in rectum and cystoscope in urethra the tissue between the two is less than normal. The bladder is very little trabeculated, no diverticula, no stone present.

Examination by Dr. Thomas.—Pains: Has been subject to pains in legs since bladder began to trouble him, intermittent and in various places, felt as if a knife were thrust about and then withdrawn. Does not think the skin was sensitive after them. Since operation has been much better. Sexual power decreasing for two years. The optic nerves are normal, pupils somewhat eccentric and irregular in outline. They react to light and during accommodation. The muscular strength and movements of the arms are normal. Triceps and biceps reflexes are present on both sides. The walk is firm and station good with feet together and eyes open. When the eyes are closed there is some swaying, but no tendency to fall. No disturbance of sensation over sacral segment. Gluteal, cremasteric, and abdominal reflexes are present. Knee kicks present on both sides but somewhat subnormal. Ankle reflexes only obtained upon reinforcement. No abnormality of sensation. The case is, I believe, one of local trouble of the bladder. There are, however, things that suggest the possibility of tabes, i. e., the pains, which although not perfectly characteristic, make one think of those in tabes. The deep reflexes in the legs are decreased, but other than this there are no other objective findings indicative of spinal cord diseases.

February 24, 1906.—The dribbling continues when the patient is on his feet, but after sitting he voids 150 cc. in a good stream. The bladder holds 300 cc. on forced distention. The urine is almost clear and contains a little pus. The patient is advised to dilate the bladder by hydraulic pressure twice daily, to keep quiet and wear a jock-strap to hold the penis up against the abdomen.

May 8, 1906.—Letter. My condition is improved somewhat. The bowels are somewhat torpid and require purgatives. The severe nightly recurrent pains have let up and there seems now to be a girdle or section of skin about eight inches wide around the abdomen and back that is ex-

tremely sensitive to the touch, chafing of underclothes and exposure to the air. The feeling in a way is like that of a burn from which a dressing was suddenly removed. The incontinence of urine is gradually lessening, and is 50% better than when I saw you.

May 8, 1906.—Letter from physician. The patient has been improved in a general way. The severe pain which came on at 12 p. m. or 1 a. m. every night for a considerable period, gradually subsided, and now has entirely ceased to occur. As this pain gradually disappeared a new symptom came on, viz., a hypersensitive condition of the skin around the lower abdomen corresponding to the region supplied by the lumbar nerves. The obstinate constipation has disappeared and his control of the bladder has perceptibly improved. He certainly shows more symptoms of incipient tabes now. He is losing in weight and is not able to work, and is mentally exceedingly irritable.

May 21, 1906.—Letter. I void urine naturally once in three or four hours, and get up not more than once at night, and sometimes not at all, to urinate. The largest amount voided at one time is nine ounces. I have never had any incontinence at night, and the occasional dribbling of urine which has been present during the day is improving.

September 17, 1906.—Letter. I void urine naturally about four times during the day and once at night, as much as 10 ounces at a time. No pain, no erections. Incontinence during the day, but none at night. His physician reports that the hypersensitive condition which was present around the abdomen has increased and now involves the chest as far as the second dorsal vertebra and the patient says he feels as if there were a constricting band over this entire area. Lightning pains have been present once. There is a marked swaying when the eyes are closed, difficulty in walking at night and ataxic symptoms have increased considerably.

Pathological report.—The specimen, G. U. 194, consists of the two lateral lobes of the prostate gland and one Cowper's gland. The right lobe measures 2 x 3 x 1.5 cm., is firm, but elastic, and on section numerous small black calculi are seen in the peripheral portion. It is moderately glandular and has considerable fibrous stroma. There are some nodules which are firm and smooth and apparently entirely fibrous tissue. The left lateral lobe consists of two parts connected by a narrow neck of tissue. The intravesical portion is quite lobulated and succulent, and on section very glandular. The extravesical portion seems to be fibrous. No mucous membrane, no ejaculatory ducts, no calculi removed. Cowper's gland is a small globular mass about 8 mm. in diameter and is normal in appearance.

Microscopic examination.—The section shows a rather fibro-muscular type of hypertrophy with small accumulation of gland ducts here and there. In the intravesical portion of the left lateral lobe, however, there is present a fair amount of gland tissue. The stroma in this latter tissue is very dense, contains a large amount of muscle, and about numerous acini there is considerable accumulation of round and polynuclear cells. In the right lateral lobe

and extravesical portion of the left, the tissue is largely made up of a stroma composed of muscle. The acini are not at all dilated, but about the majority of them there is a round cell and polynuclear cell infiltration which invades only to a slight extent the interstitial stroma. Some evidence of new connective tissue formation about a few of the acini is seen.

This is distinctly a myomatous type of hypertrophy, there being a very small amount of fibrous tissue present, and except in one small portion of the left lateral, the gland tissue is rather sparse. Some corpora amylacea are present in the ducts.

CASE 120.—*Considerable enlargement of right lateral lobe. Very little residuum. Contracture of bladder. Painful erections. Cure of obstruction, and improvement of pain in posterior urethra. Followed six months.*

No. 1090. J. R. M., age 59, married, admitted November 4, 1905.

Complaint.—"Slight frequency of urination. Frequent painful erections at night."

The patient had gonorrhœa at the age of 20, was apparently perfectly cured, had no further trouble until 19 years ago when he began to have painful erections at night. He would wake up with pain in the perineum and find the penis erect. Urination will relieve the erection and the pain, but in an hour or two he would be awakened again and find the same condition present. He was treated by a physician and sounds were passed twice a week for a year without relief of his symptoms. He has continued to suffer as above described for 19 years.

S. P.—The patient is wakened from one to three times every night with painful erections and has to urinate to relieve the condition. Occasionally a night passes without having erections, and he then may not have to urinate at all during the night. Micturition is normal during the day.

Sexual powers are fairly normal, intercourse satisfactory. There is hesitancy at the beginning of urination and the stream is usually small. He often has difficulty in urinating while in the standing position and usually sits down.

Examination.—Patient is a well nourished man, lips of good color. Chest and abdomen negative.

Rectal.—The prostate is distinctly broader than normal and the right lobe is larger than the left. The surface is smooth, firmer than normal, but not markedly indurated nor very tender. There are no nodules. The seminal vesicles are not enlarged but are indurated at their juncture with the prostate. There is no intervesicular mass, no enlarged glands to be felt. The prostatic secretion contains some pus cells, many lecithins, few granule cells and spermatozoa.

Urinalysis.—Clear, acid, 1018, no sugar, no albumin, no pus cells or bacteria. Urea 16 gm. to the liter.

Cystoscopic.—A coudé catheter passes with ease and finds 35 cc. residual urine. The bladder capacity is contracted, holding 300 cc. on forced distention. The cystoscope shows considerable intravesical enlargement of the right lateral lobe, no intravesical hypertrophy of the left lateral lobe

and very little median enlargement, the bar being replaced by a cleft, as shown in the cystoscopic pictures which are reproduced in the article on cystoscopy of the prostate (Fig. 25). The bladder is very little trabeculated. There is no pouch formation and no diverticula, no cystitis, no calculus. With finger in rectum and cystoscope in urethra the beak is easily felt, the median portion is very slightly greater than normal

Operation, November 15, 1905.—Ether. Perineal prostatectomy by the usual technique. The left lateral lobe, as predicted, was very little enlarged, but it was easily enuclated in one piece. The right lateral lobe was removed in two pieces, the first being about the size of the left lateral lobe, and superficial examination seemed to show that everything had been removed. On rotating the tractor and directing one of the blades upward a large intravesically projecting portion of the right lateral lobe was found, engaged with the tractor, and drawn down into the right lateral cavity. It was evident that the blade of the tractor had slipped beneath the anteriorly projecting right lateral lobe, as shown in Fig. 36. It was very easily enucleated without removing any mucous membrane which covered it, and measured about 2½ x 3 x 5 cm. in size. There was only a moderate amount of hemorrhage and no tubes were inserted in the bladder, as the operator was anxious not to infect it. The lateral cavities were lightly packed and the wound closed as usual. The patient stood the operation well, the pulse at the end being 100. Infusion on return to the ward.

Convalescence.—The patient reacted well and had an uninterrupted convalescence. Temperature on the night after the operation was 100.4°, but after that was practically normal. There was very little hemorrhage and urine passed through the penile urethra on the night after the operation. The gauze drains were removed on the next day and the fistula closed on the eleventh day. On the third day after the operation the patient was walking about his room, and he left the hospital on the eighteenth day. Interval urination was established immediately after the operation, being at first two hours between urinations. After that the interval gradually increased, and on discharge he was voiding urine in a large stream at intervals of three hours with no incontinence and no pain. The catheter passed with ease, meeting no obstruction and found 85 cc. residual urine. The wound is tightly healed. The urine contains no pus cells, no bacteria.

December 24, 1905.—Letter. I void urine naturally at 2 a. m. and 6 a. m. and about every three hours during the day, half a pint at a time. I have no pain. Erections have returned.

January 10, 1906.—I can go all night without urinating, stream is free and I have no pain. Erections seem to come when the bladder is full. I have not had intercourse as yet.

February 16, 1906.—Letter. During the last week I have had no painful erections, in fact my pain has entirely subsided, and I now think it is due to gout.

May 6, 1906.—Letter. I pass urine freely, which I did not do before the

operation, but I have a constant uneasy feeling in a sore spot in the deep urethra, the same as before operation. I void urine twice during the night, about half a pint at a time. I have no pain except the constant uneasiness spoken of above. I have erections and intercourse, but it is not very satisfactory. The seminal ducts feel sore. The operation has not relieved the tendency to erections at night which keep me from sleeping, and seems as though I had neuralgia in that region. The irritation does not come on until after midnight.

September 13, 1906.—Letter. I void urine naturally four times during the day and twice at night. I still have painful erections which awaken me during the night. Intercourse is not very satisfactory, being somewhat painful. I have no urinary trouble, and, although I am improved by the operation, as regards painful erections I am not entirely cured.

Pathological report.—The specimen, G. U. 199, consists of three portions, a small left lateral 3.5 x 1 x 2 cm., a right lateral about the same size and an oval lobule, the intravesical portion of the right lateral lobe, 3 x 2.5 x 2 cm. in size. On section all three portions are succulent and juicy, soft and elastic, and seem exceptionally cellular. The surface has a rather granular appearance, is yellowish in color with very small intervening trabeculæ of fibrous tissue. No mucous membrane, no ducts, no calculi removed.

Microscopic examination.—The prostate shows in different places a mixed type of hypertrophy. There are certain portions where the gland tissue is very abundant, arranged in lobules, and the acini in some of the lobules quite dilated. In others the dilatation is moderate, but the lumina of the ducts are quite irregular and complex. About the lumina of the ducts very distinct muscular bands are noticed, while the intervening stroma is mostly fibrous. The stroma in the areas where the gland tissue is not so markedly arranged in lobules, is composed about equally of muscle and fibrous tissue, and the concentric arrangement of the muscle fibers about the acini is not so marked. Here and there one sees acini about which there has been considerable connective tissue formation. There are occasional areas of round cell and polynuclear cell infiltration. In other parts of the prostate the gland tissue is very sparse, and the stroma is largely composed of muscle, in places grouped together in almost pure bundles of muscle. Some of the acini which are present in this muscular portion are dilated, while others are compressed. Here and there are areas of round cell and polynuclear cell infiltration with some formation of new connective tissue.

We have in this prostate a distinctly adenomatous type with a relatively small amount of fibro-muscular stroma and a myomatous type in which the glands and connective tissue elements are insignificant.

CASE 121.—*Moderate enlargement of median and lateral lobes. Cure. No complications. Followed six months.*

No. 1100. J. L., age 58, married, admitted November 16, 1905.

Complaint.—"Prostatic trouble."

No history of gonorrhœa.

Present illness began two years ago with slight difficulty and frequency of urination which gradually increased until January, 1904, when he had complete retention of urine, requiring catheterization. Six months later a second retention after which he was catheterized for a week. Since then urination has been more difficult and he has catheterized himself frequently on account of complete retention of urine. For one month the catheter has been used once daily and micturition about every hour. There has been a slight pain in the bladder, none elsewhere. Hemorrhage only once. No loss of weight. General health excellent.

S. P.—The patient catheterizes himself at bedtime and withdraws about a pint of residual urine, after that does not void until morning, but during the day voids urine about every hour with difficulty and occasionally slight pain. Sexual powers were normal up to a month ago.

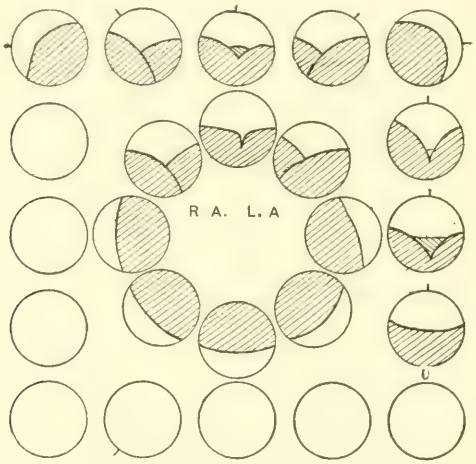


Fig. 50.—Case 121.

Examination.—Patient is sparely built, but a healthy looking man, with lips of good color. No arteriosclerosis. Pulse regular and of good volume. The chest and abdomen are negative.

Genitalia.—Negative.

Rectal.—The prostate is slightly enlarged, smooth, in places slightly irregular, elastic but firmer than normal, and at the upper end near the juncture with the seminal vesicles there is a slight induration. The seminal vesicles are soft and not distended. No enlarged glands are to be felt. Massage of the prostate shows a moderate amount of tenderness, there is no intervesicular mass, no induration in the region of the trigone.

Urinalysis.—Cloudy, acid, 1027, albumin a trace, no sugar, microscopically, pus, no casts, no bacteria.

Cystoscopic.—A coudé catheter passes with ease and finds only 100 cc.

residual urine. The bladder is irritable, rebels at 300 cc. and is evidently slightly contracted. The cystoscope shows (Fig. 50) a slight intravesical hypertrophy of the lateral lobes, and a fairly large median lobe with a sulcus between it and the lateral lobe on each side, and seen unusually high up, in RA and LA respectively, as shown in the accompanying chart. In Series U the small size of the anterior sulcus is seen. In the pictures shown in the top row of circles progressive views by rotating the instrument from L through LA, A, RA, to R are shown. As seen here, the commissure between the median lobe and lateral lobe occurs very far forward. The bladder wall is only slightly trabeculated and there are no diverticula present. No calculus seen. The trigone and ureters cannot be made out with certainty.

Operation, November 22, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were moderately hypertrophied and easily enucleated. The median lobe was about 2½ cm. in diameter and was easily removed through the right lateral cavity, only a small tear being made in the lateral wall of the urethra in extracting it. Examination with the finger afterward showed no remaining obstruction. Owing to the fact that the bladder was sterile it was thought best not to insert rubber drainage tubes. The lateral cavities were packed with gauze and the skin wound was partially closed as usual. The patient stood the operation well, pulse at the end being 100. Infusion on return to ward.

Convalescence.—The patient reacted well. During the night following the operation the bladder became distended with urine, the gauze drains were removed, but the patient was still unable to urinate and had to be catheterized. On the following day he was nauseated and vomited and was given a submammary infusion and salt solution per rectum. On the night of the third day retention of urine again came on and the patient was catheterized. After that there was no further retention. He was up in a wheel chair on the third day and began to walk on the fourth day. Urine came through the anterior urethra on the fifth day and in a few days most of it came through the meatus. The perineal fistula healed on the 20th day, and he left hospital on the 21st day, able to retain urine for four hours, voided freely in a large stream without incontinence or pain. Examination of the urine showed no bacteria, but numerous pus cells were present.

April 4, 1906.—I void urine at normal intervals during the day and do not rise at night. I have perfect control, no pain. Urination is entirely normal. Erections have returned, and sexual intercourse has been indulged in. Ejaculations are about normal.

June 5, 1906.—Letter. My condition remains excellent. Urination is normal. Sexual intercourse is entirely satisfactory.

Pathological report.—The specimen, G. U. 202, consists of three lobes of the prostate, each of the three lobes having been removed in one piece, and weighs in all 15 gm. The lateral lobes are equal in size and measure 4.5 x 4 x 2 cm. The external surfaces are encapsulated and fairly smooth, they are elastic, and on section show a moderate amount of gland tissue

and a definite amount of stroma. The median portion of the prostate measures 2 x 1.5 x 1.3 cm., and is somewhat similar in appearance to the lateral lobes. No mucous membrane, no ejaculatory ducts, no calculi removed.

Microscopically both lateral lobes contain about the same amount of gland tissue which is much in excess of the stroma. The middle lobe contains distinctly more stroma than either of the lateral lobes, and the gland tissue and stroma are present in about equal amounts. The gland tissue is rather diffusely distributed with here and there considerable aggregations of alveoli. There is moderate dilatation of the majority of the acini with here and there some cystic dilatation with flattening of the lining epithelium. There are occasional areas in which the alveoli show invagination and proliferation. The stroma contains rather more fibrous than muscle tissue with here and there points of rather dense accumulation of some round but more polynuclear cells. About some of the acini, in circumscribed areas, there is rather dense inflammatory infiltration with endoglandular proliferation and epithelial degeneration.

Case 122.—*Very large hypertrophy of median and lateral lobes. Oxalate calculus. Cure. Followed six months.*

No. 1122. D. M., age 71, married, admitted December 19, 1905.

Complaint.—" Frequent painful urination."

Gonorrhœa in early youth, no gleet or stricture subsequently.

Present illness began 10 years ago with a severe sharp pain in the left side and back which radiated to the left groin and testicle. About a month later he had a similar attack and shortly afterwards three other attacks. Since then he has been free from pain in his side and back, but has had irritation in the bladder and pain at the end of urination referred to the head of the penis, and urination has been more frequent than normal. Eight years ago he had complete retention of urine requiring catheterization, and since then has been catheterized about 20 times for this reason.

S. P.—Urination every half hour night and day, imperative and associated with considerable pain at the end of urination and located in the head of the penis. Urination difficult, stream small, amounts voided little. His general health is excellent. No hematuria.

Sexual powers.—There has been no sexual desire and no erections for the past two years.

Examination.—The patient is a ruddy, healthy looking man. There is no arteriosclerosis. The chest and abdomen are negative.

Genitalia.—The left testicle is small and indurated, globus major large and indurated, the minor soft. On the right side there is a hydrocele present and the entire epididymis is considerably enlarged and indurated.

Rectal.—The prostate is markedly enlarged, forming a globular mass about as large as a good sized orange. It is elastic, not tender, and generally smooth. Lying on the posterior surface about its middle are two peculiar irregular lobulations which seem to project through the posterior capsule, and are so close to the rectum that they almost seem to be in

the rectal wall. But the rectal mucosa is not adherent to them. The consistence of these small lobulations is firmer than that of the prostate, but not extremely hard. The seminal vesicles cannot be reached. No enlarged glands are palpable, prostate not tender.

Cystoscopic.—Coudé catheter passes with ease and finds 200 cc. residual urine. The bladder is very irritable, apparently contracted and will not admit more than 250 cc. The cystoscope shows a large, irregular oxalate calculus, freely movable in the bladder. Owing to hemorrhage it is impossible to make out the intravesical portion of the prostate, but a large median lobe was made out.

Urinalysis.—Slightly cloudy, acid, 1016, albumin a trace, no sugar, few pus cells, many bacilli, some micrococci, no casts.

Preliminary treatment.—Catheterization three times daily, urotropin, hydrotherapy.

Operation, December 27, 1905.—Ether. Perineal prostatectomy by the usual technique. The posterior surface of the prostate and rectum were very adherent, and had to be dissected apart. The irregular lobules, felt on rectal examination, were not seen, evidently being dissected off with the rectum. An orderly holding the urethral staff punctured the urethra at the beginning of the membranous portion and considerable difficulty was experienced in finding the membranous urethra and introducing the tractor. The lateral lobes were enucleated very easily, each in one piece, and were very much enlarged (Fig. 51). Quite a large median lobe was drawn down and removed through the right lateral cavity. The calculus was extracted through the dilated prostatic urethra. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. The patient stood the operation well; infusions and continuous irrigation on return to ward.

Convalescence.—The patient reacted well. The gauze and tubes were removed on the following day and he began to walk on the fourth day. The urine began to flow through the urethra on the third day, and the patient was discharged from the hospital on the 30th day. At that time he was able to retain urine for four or six hours, had perfect control, no pain, and felt well.

February 27, 1906.—Small amount of urine escapes through a perineal fistula with each urination which occurs at intervals of four to five hours. Sounds meet an obstruction in the membranous urethra, but a filiform passes with ease, and a dilating follower, No. 29-F., passes into the bladder. (In this case rupture of the urethra was produced at operation by an orderly who was holding the urethral staff.)

March 3, 1906.—Patient voids with a better stream and the fistula is much smaller. There is still slight dribbling after urination.

May 14, 1906.—The fistula is almost closed, only a few drops of urine escape. There is no incontinence, but the end of urination is accompanied by a slight dribbling.

May 17, 1906.—There is a pin point fistula in the perineum. Only a few drops of urine escape through it and the patient voids twice at night and

at intervals of four hours during the day. Has no incontinence of urine at night, but during the day occasionally, while walking, there is a slight involuntary escape of urine, but this is improving.

Examination.—Silver catheter passed with ease. There is a slight hitch at the membranous urethra, but after manipulation the catheter passes



FIG. 51.—Large median and lateral lobes. Case 122.

with ease and withdraws 25 cc. residual urine, bladder capacity 450 cc. Voided urine is almost clear and contains microscopically only a few pus cells and bacilli.

June 16, 1906.—Patient returns for examination. He says that the incontinence has ceased. He is able to retain urine for three or four hours, and the perineal fistula is now very small. His condition is excellent.

September 18, 1906.—The patient voids urine naturally, five times during the day and twice at night, about half a pint at a time, no pain, no erections. There is a pin-point perineal fistula through which a few drops of urine escape during urination. A catheter passes but detects a stricture of large caliber at the membranous urethra. There is no residual urine present. The stricture is dilated up to 35-F. with the Kollmann dilator, and the fistula partially excised and curetted.

Pathological report.—The specimen, G. U. 222, consists of the three lobes of the prostate which have been removed in four pieces and weighs about 90 gm. The left lobe is a globular mass measuring 5 x 3.5 x 3 cm.; it is smooth and encapsulated, and on section shows many dilated ducts and considerable stroma. The right lateral lobe is in two pieces forming a mass about as large as the left and similar in character. A piece of the lateral wall of the urethra is attached to one of the pieces. The middle lobe is a rounded mass, 4.5 x 3.5 x 3 cm. in size, fairly smooth, and on section shows more gland tissue and less stroma than the lateral lobes. No ejaculatory ducts removed. An oxalate calculus about 2 cm. in diameter with a very nodular surface was removed.

Microscopic examination.—The hypertrophy is a lobulated glandular one. The acini are dilated, with many areas of cystic degeneration. There is considerable endoglandular proliferation and degeneration of the epithelial cells. The stroma is rather dense, is mostly composed of fibrous tissue, and there is present some inflammatory infiltration. The arteries show a moderate degree of arteriosclerosis.

Case 123.—*Moderate enlargement of median and lateral lobes. Residuum 325 cc. Cure. Followed five months.*

No. 1121. A. W. F., age 57, married, admitted December 19, 1905.

Complaint.—"Frequency and difficulty of urination."

No history of gonorrhœa.

Present illness began three years ago with hesitation and slight difficulty in urination. Since then there has been a gradual increase in the difficulty and frequency of urination, but he has had no pain except when the bladder becomes full. No hematuria. His general health has remained good.

S. P.—Urination two or three times at night. Micturition difficult, slow, stream small, painless. Sexual powers normal.

Rectal.—The prostate is moderately enlarged, bulging towards the rectum, rounded, smooth, very soft, not tender. The seminal vesicles are palpable and not indurated. Prostatic secretion contains a few pus cells, lecithin, and a few granule cells.

Urinalysis.—Slightly cloudy, acid, 1012, no albumin, no sugar, pus cells, a few epithelial cells, many micrococci.

Cystoscopic.—A catheter passes with ease and finds 325 cc. residual urine. The bladder capacity is large. The cystoscope shows a very small rounded, slightly elevated median lobe with very small sulci on either side. The lateral lobes are only slightly enlarged intravesically. The bladder

is trabeculated and there are numerous pouches and cellules, but no definite diverticula. The vesical mucosa is only slightly inflamed. With finger in rectum and cystoscope in urethra the beak is easily felt, and the median portion of the prostate shows a slight but definite enlargement.

Preliminary treatment.—Catheterization two or three times daily, urotropin, hydrotherapy.

Operation, December 27, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were quite adherent to the capsule and urethra, and in removing the deeper portions it was necessary to employ the sharp periosteal elevator. A portion of the median bar was removed in one piece with the right lateral lobe. The tractor was then removed and the finger inserted in the urethra, and showed a circular constriction of the prostatic orifice which was difficult to dilate with the finger. Examination showed very little remaining prostatic tissue in the median portion, so that it was not thought necessary to remove anything further. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. The patient stood the operation well. No infusion was given. Continuous irrigation was given on return to the ward.

Convalescence.—The patient reacted well. The tubes and gauze were removed on the day after the operation, and he was out of bed the next day. Urine came through the penis on the fourth day, interval urination was established within a week, the fistula closed on the 14th day, and he was discharged on the 22d day after the operation, voiding urine at intervals of four to six hours with perfect control and the perineal wound healed.

May 26, 1906.—The patient returns for examination. He voids naturally in a large stream four or five times during the day and not at all during the night, about one pint at a time. He suffers no pain. Intercourse is entirely normal. He has had no complications and no treatment. His general health is good and he has gained 10 pounds in weight. The urine is clear, acid, 1006, no albumin, microscopically negative.

September 14, 1906.—Letter. The fistula closed 10 days after the operation and has not been open since. I void naturally four or five times a day, sometimes not at all at night, about one pint at a time. No pain. I am cured.

Pathological report.—The specimen, G. U. 221, consists of three pieces of tissue. The left lobe comprises two of these pieces, one of which is a small lobule about 1 cm. in diameter, and the other mass 3 x 2 x 1 cm. On section the tissue is comprised of lobules which seem rather fibrous in character, although areas apparently glandular and with dilated acini are noted. The right lateral lobe is a mass 3 x 2 x 1 cm. It is firm and elastic in consistence, and on its cut surface several spheroidal lobules are seen. The total weight is about 12 grams.

Microscopic examination.—The hypertrophy tends towards the fibro-

muscular type, although in some areas the gland tissue is fairly abundant. The acini in these areas show the usual typical picture. The stroma is largely composed of fibrous tissue, there being present practically no muscle. Some areas of prostatitis are present. The arteries show a moderate degree of arteriosclerosis.

Case 124.—*Moderate hypertrophy median and lateral lobes. Induration suggesting malignancy. Cured.*

No. 1332. J. J. J., age 58, married, admitted December 17, 1905.

Complaint.—" Inability to pass urine."

No history of gonorrhœa.

Present illness began about 15 years ago with slight difficulty and frequency of urination which gradually increased. Ten years ago he was getting up four times at night, and during the last year from eight to twelve times at night to urinate, and he had considerable difficulty, pain and straining on urination. Two weeks ago he had complete retention of urine for the first time and was catheterized, and since then he has been using the catheter himself, being unable to void urine naturally. His symptoms have gotten steadily worse, and he suffers considerable pain. No history of hematuria, calculus or pain in other regions.

Sexual powers.—Absent.

Examination.—The patient is fairly well nourished. His pulse is full, bounding, regular, 92, no arteriosclerosis. The heart and lungs are negative. There is considerable tenderness over the region of the bladder, but the abdomen is otherwise negative.

Rectal.—The prostate is considerably enlarged, globular in shape and about the size of a small orange. It is elastic, but slightly harder than usual, but the seminal vesicles are negative and there is no intervesicular mass. The surface is slightly irregular, but there are no enlarged glands, the rectal wall is not adherent and no evidence of malignancy.

Cystoscopic.—The patient has a retained catheter, retention of urine being complete. The bladder has become contracted and holds only 180 cc. on forced distention. The cystoscope shows a sessile rounded median lobe with a fairly deep sulcus on each side. Both lateral lobes are enlarged, and there is a fairly deep sulcus in front. Numerous mucous polyps are seen attached to the prostatic lobes in various places, and on the summit of the left lateral lobe is a peculiar sharp pointed peak.

Preliminary treatment.—Continuous catheterization for 10 days. Hydrotherapy and urotropin. On the evening after admission the patient had a chill and the temperature rose to 104.6°. For the next five days the temperature ranged between 101° and 103°. After that it was practically normal. About 3000 cc. of urine was voided daily.

Urinalysis.—Cloudy, 1008, faintly acid, no albumin, no sugar. Red and white blood corpuscles.

Operation, December 28, 1905.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were quite adherent to the prostate

and quite difficult to enucleate. Examination of the specimens showed considerable induration in spots and the posterior portion of the right lobe suggested malignancy. Frozen sections were therefore made, but microscopic examination showed the area to be composed almost entirely of fibrous tissue. A moderately enlarged median lobe was removed in one piece with the left lobe, a tear being made in the urethra, but no mucous membrane was removed and the ejaculatory ducts were preserved. The wound was closed as usual with double catheter drainage, and light packs for the lateral cavities. He was infused on the table and stood the operation well, pulse at the end being 90. Continuous irrigation on return to the ward.

Convalescence.—The patient reacted well, the highest temperature being 100.2° on the day after the operation. The gauze and tubes were removed 24 hours after the operation and the patient was up in a chair on the third day. On the 12th day the patient complained of slight pain in the right leg which was found to be somewhat œdematous. Examination showed no phlebitis, and the swelling soon disappeared. He was discharged on the 22d day in good condition, most of the urine passing through the urethra, a small perineal fistula still present. The perineal fistula finally closed.

March 6, 1906.—Letter. The wound has remained healed. I void urine naturally three or four times during the day and once or twice during the night, about one-third of a pint at a time. I suffer a slight pain after urination, but my general health is good, and I have gained in weight.

May 12, 1906.—Letter. The wound has remained healed, and I am cured. I void urine naturally three or four times during the day and once at night, about a pint at a time. I suffer no pain. Have not had erections or intercourse. My general health is good.

September 18, 1906.—Letter. I void urine naturally three times during the day and once at night, and without pain. Sexual intercourse is not entirely satisfactory. I consider myself cured.

Pathological report.—The specimen, G. U. 223, consists of three pieces of tissue representing the two lateral and the median lobes. The lateral lobes are of about equal size and weigh about 10 gm. The median lobe weighs about 7 gm. The ejaculatory ducts have not been removed. No calculus. The tissue is composed of a number of spheroids of varying size, consistency soft and homogeneous.

Microscopic examination.—The hypertrophy is a lobulated moderately glandular one. Certain lobules show complexity of outline. The stroma is rather small in amount. In other lobules the acini are small, separated by broad bands of stroma, with evidence of considerable fibrous tissue hyperplasia. The new fibrous tissue is arranged concentrically about small oftentimes atrophied acini, and there is a considerable interstitial inflammatory infiltration. The stroma, as a whole, contains considerably more connective tissue than muscle. The arteries show a moderate degree of arteriosclerosis.

CASE 125.—*Very little enlargement of lateral lobes. Small pedunculated median lobe. Complete retention. Cure. Followed five months.*

No. 1138. V. J. B., age 77, widowed, admitted Dec. 31, 1905.

Complaint.—"Complete retention of urine."

Gonorrhœa at the age of 18.

Present illness began four years ago with frequency of urination, which gradually increased. About six months ago he began to suffer pain at the beginning of urination. It was generally located in the neck of the bladder and radiated to the head of the penis, and at times in the right back. Of late urination has been very frequent, and pain severe. One week ago complete retention of urine came on and since then the patient has been catheterized three or four times daily.

Sexual powers.—No note made. General condition fairly good, but weak. Three years ago he had pain in the region of the right kidney, radiating to the testicle, and occasionally blood in the urine, but never passed a calculus.

Examination.—The patient is very thin, but his color is good.

Chest.—The percussion note is slightly hyperresonant, and on auscultation sounds harsh. Expiration is prolonged and an occasional dry râle is heard. The heart and abdomen are negative.

Genitalia.—Negative.

Rectal.—The prostate is very little larger than normal, firm, but not of stony hardness, and somewhat tender. The lateral lobes project upward more than normal, but the region of the seminal vesicles is negative. There are no enlarged glands to be felt. A slight rectal stricture is present, and a depression is felt on the left side, the site of an old fistula.

Urethral.—Catheterization is difficult. The operator failed with a small coudè catheter, silver catheter and a straight rubber catheter, but was finally able to pass a rubber catheter threaded upon a stilet with a Béniquê. About one pint of urine evacuated. The stilet was then withdrawn and the rubber catheter fastened in place with adhesive plaster.

Preliminary treatment.—Continuous drainage through a retained catheter, urotropin, water in abundance. In order to prevent contracture of the bladder, the end of the catheter was kept plugged and the urine evacuated when the bladder became full.

Cystoscopic, January 4, 1906.—The cystoscope shows a very small rounded median lobe with a shallow sulcus on each side. The lateral lobes are very little enlarged intravesically, and there is no sulcus between them in front. The bladder is markedly trabeculated with numerous large pouches, but no diverticula. There is no calculus present.

Urinalysis.—Cloudy, acid, 1009, no sugar, albumin a trace. Total urine 2200 cc. Total urea 19 gm. Microscopically, pus, few epithelial cells, no casts.

Operation, January 8, 1906.—Ether. Perineal prostatectomy by the usual technique. After exposure of the posterior surface the prostate did not seem at all enlarged. The lateral lobes were easily enucleated, but were

no larger than normal (Fig. 52). A small mass of tissue from the median portion of the prostate was removed through one of the lateral cavities with the aid of the tractor. After removal of the instrument the finger was inserted and a small pedunculated median lobe discovered. It was impossible to push it into one of the lateral cavities, but it was easily engaged by forceps passed down the urethra by the side of the finger. It was then drawn into the urethra and excised with scissors, the mucous membrane covering it being removed at the same time. Examination showed no further obstruction present, and the wound was closed as usual with double tube drainage and light packs for the lateral cavities. Infusion on the table, continuous irrigation on return to ward. Patient stood the operation well. Pulse at end 115.

Convalescence.—The patient reacted well. For three days he had a temperature between 99° and 100°, but after that it was practically nor-

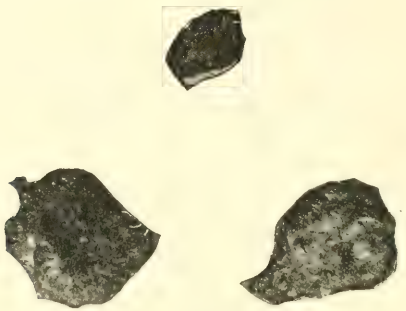


Fig. 52.—Very small median and lateral lobes, causing complete retention of urine. Natural size.

mal. The irrigation was discontinued at the end of 24 hours, the gauze was removed at the end of 32 hours, and the drainage tubes at the end of 48 hours. Urine began to flow through the anterior urethra on the 11th day, and on the 18th day was able to retain urine for three hours and had perfect control. The patient was walking about the ward on the seventh day, but the perineal fistula, although very small, was slow in closing, but was apparently closed on the 32d day when the patient was discharged. His condition was excellent. The urinary stream good, interval from two to five hours.

February 13, 1906.—A small pin-head fistula persists. A catheter passes with ease and finds 25 cc. residual urine and a bladder capacity 350 cc.

March 8, 1906.—A few drops of urine still escape through a very fine fistula during urination. It has been curetted, and treated with nitrate of silver several times. A catheter finds no residual urine. Bladder capacity 380 cc., and a No. 28 sound passes with ease.

April 7, 1906.—The fistula is not yet closed. It is curetted with a gimlet curette, and the urethra is dilated to 35-F. with the Kollmann dilator.

May 1, 1906.—The patient voids urine at intervals of five hours without difficulty or pain. A silver catheter passes with ease and finds 10 cc. residual urine, a bladder capacity of 300 cc. General health is excellent.

May 24, 1906.—The patient returns for examination. The fistula has been closed one week, he voids urine naturally at intervals of three to four hours, from 200 to 300 cc. at a time. He suffers no pain, has no incontinence, and his general health is excellent. He considers himself cured.

June 16, 1906.—The patient is able to retain urine for four hours and a half and voids as much as 340 cc. at a time. His general condition is excellent.

September 12, 1906.—Letter. I void urine naturally about three times during the day and two or three times at night; the largest amount at one time is 250 cc. I do not have erections. My general health is improved and I consider myself cured.

Pathological report.—The specimen, G. U. 228, consists of five pieces. The right lateral has been removed in one piece and measures 1.3 x 1 x 1 cm. It is lobulated, soft, and on section shows considerable gland tissue with definite fibrous stroma and no dilated ducts. The left lobe is composed of two pieces, the smaller lobule has a smooth surface and is about the size of a pea, and the larger is about the size of the right lobe. On section it is similar to the right. The middle lobe consists of two pieces, the smaller the size of a small pea, and the larger about the size of a bean, and one surface is covered with mucous membrane. This formed a pedunculated lobe which was removed by the finger through the urethra. The entire prostate probably does not weigh more than 10 gm., no ducts, no calculi.

Microscopic examination.—The right lobe shows a rather adenomatous tissue with a lobular arrangement. The acini have convoluted walls, and the stroma contains more fibrous than muscle tissue. Outside of the glandular lobules there is considerable stroma with acini scattered here and there through it. The left lateral shows more cystic dilatation than the right, and contains probably more gland tissue. The stroma between the intra- and extralobular acini contains a rather large amount of fibrous tissue. Here and there about acini there is considerable newly formed connective tissue. In the middle lobe the gland tissue is comparatively sparse, while the muscle and fibrous tissue of the stroma is present in varying amounts in different areas. About nearly all of the acini which are present, is a well marked prostatitis with proliferation and desquamation of the lining epithelium in varying amounts in different acini. The infiltration in places has extended well out into the interstitial tissue and there has been a considerable formation of new connective tissue. In these fibrous areas merely vestiges of former acini are to be seen.

The hypertrophy in this case is of a rather mixed variety, in places the stroma being in excess and in others the adenomatous tissue. The stroma as a whole contains more fibrous tissue than muscle, and this is especially true in the middle lobe where almost pure fibrous nodules are present.

Case 126.—*Moderate enlargement of lateral lobes, in front of urethra. Residuum 940 cc. Cure. Followed four months.*

No. 1123. A. H. S., age 65, married, admitted December 19, 1905.

Complaint.—"Frequency of urination and pain in the lower abdomen."

No history of gonorrhœa.

Present illness began six years ago with difficulty and increased frequency of urination. The progress of the case was very slow and three years ago he began to suffer pain in the lower abdomen when the bladder became full. Five months ago he had an attack characterized by great pain in the bladder, straining on urination at intervals of from one to two hours. Complete retention of urine came on for the first time three months ago, and one quart of residual urine was withdrawn. Since then

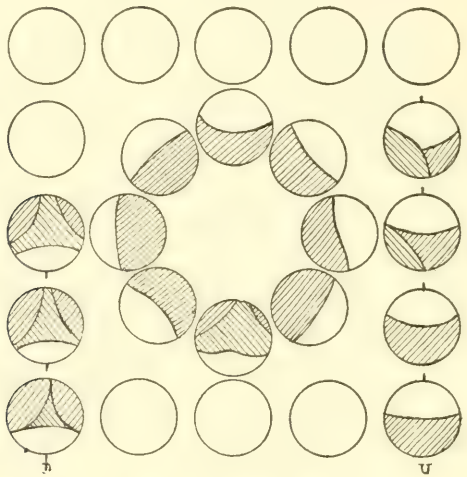


Fig. 53.—Case 126.

catheterization has not been required. Urination every hour during the day, three or four times at night. Pain generally present in the lower abdomen. None in urethra, perineum or back. Occasional dribbling at the end of urination. He has not lost weight. Sexual powers have remained fairly normal. Erections, coitus and ejaculations about normal.

Examination.—The patient is sparely built, but apparently sturdy, lips are of good color. The arteries are only slightly thickened, and the pulse is regular and of good volume.

Chest.—No note.

Abdomen.—The lower abdomen is distended and on percussion, an overdistended bladder reaching the umbilicus is felt. Genitalia negative.

Rectal.—The posterior surface of the prostate feels no larger than normal, and is about normal in shape, regular, smooth, firmer than normal, but not markedly indurated. The seminal vesicles and vasa deferentia are

palpable but not indurated. Several small shotlike masses, either phleboliths or glands, are found external to the left seminal vesicle and one external to the right vesicle. Above the prostate a very large distended bladder is felt. The walls are soft, and there is no intervesicular mass of induration.

Urinalysis.—Cloudy, acid, 1016, no albumin, no sugar, no casts, small amount of pus and epithelia and numerous short bacilli.

Cystoscopic.—A silver catheter passes with ease and finds 940 cc. residual urine. The bladder is very large and the tonicity poor. The cystoscope shows no intravesical enlargement of the lateral lobes and a very slight median bar, as shown in the accompaning chart (Fig. 53). In front of the median bar two intraurethrally projecting lateral lobes are seen, and in series D, with the beak looking downward and the handle depressed they are seen to almost obscure the median bar, but on elevating the handle the median bar comes more prominently into view and the lateral lobes become separated. In series U, on elevating the cystoscope a definite intraurethral hypertrophy of the right lateral lobe is seen. The pictures in this case simulate those given by a median lobe, but careful examination shows that the rounded mass seen in 3 and 4 was an intraurethral lateral enlargement rather than a median. The bladder is greatly trabeculated with numerous deep pouches, and a diverticulum is seen near the vertex. The ureters cannot be made out, owing to pouches and trabeculation. There is quite a deep pouch behind the prostate, but it can be thoroughly explored, showing that the median enlargement is very slight. With finger in rectum and cystoscope in urethra the beak is easily felt and a small but definite median bar is made out.

Preliminary treatment.—Catheterization two or three times daily, urotropin, water in abundance. On January 2, 940 cc. residual urine was obtained, on January 3, 600 cc., and on January 4, 450 cc. On January 6 the residual had risen to 660 cc. and the patient was able to void only a small amount of urine.

Operation, January 8, 1906.—Ether. Perineal prostatectomy by the usual technique. The posterior surface of the prostate was no larger than normal, but as soon as the bilateral capsular incisions were made, the edges of the wound gaped widely, as if the tissues had been on tension, and two large, smooth hypertrophied lobules appeared in the bottom of the wound. They were separated from the posterior portion of the prostate by fibrous septum and were themselves thoroughly encapsulated and easily enucleated from the urethra and capsule of the prostate, were spheroidal in shape and measured each 3 x 4 x 5 cm. in size. They lay on each side of the urethra which was considerably flattened by them and projected anteriorly towards the symphysis pubis and not towards the bladder. After removal of the tractor a finger was inserted through the urethra into the bladder, the prostatic orifice was found to be round and circularly constricted so that it had to be dilated to admit the finger. A very thin median bar was present, not sufficient to require removal. It was evident that the lateral lobes had not projected towards the bladder. The opera-

tive findings explain why the prostate seemed very little enlarged both on rectal and cystoscopic examination. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. Continuous irrigation on return to ward.

Convalescence.—The patient reacted well from the operation. The temperature did not rise above 100°. The irrigation was discontinued after 12 hours, the gauze and tubes were both removed in 24 hours after the operation, and almost immediately afterwards urine was passed at intervals, and without incontinence through the perineal wound. On the third day the bladder became distended and catheterization was necessary. After that he was able to void at increasingly long intervals, but the urine did not come through the urethra until the 12th day. The fistula closed on the 16th day. The patient was out of bed on the 4th day, began to walk on the 6th day, and had no complications. He left the hospital on the 21st day, able to retain urine for five hours with no incontinence, no pain.

February 3, 1906.—Urine is voided freely, sometimes as much as a pint at a time, at intervals of four or five hours. The perineal wound has remained closed. The urine is only slightly cloudy, but contains pus and bacteria.

May 15, 1906.—Patient returns for examination. He says he voids urine normally, does not get up at night to urinate. He has no pain except occasionally a slight pain in the back. He passes about one pint of urine at a time. His general health is excellent. He has gained 13 pounds and considers himself cured.

Examination.—Patient looks well. There are small shotlike glands in both groins. The urine is cloudy and contains pus and bacilli.

Rectal.—In the region of the prostate a slightly indurated mass smaller than the normal prostate is felt. It is smooth, elastic, there are no nodules. There is slight induration in the region of both seminal vesicles and a few slightly indurated cords are to be felt on each side. Along the pelvic wall on the left side one gland about 1 cm. in diameter, but fairly soft, is felt. Several small shotty bodies are felt along the rectal wall. A catheter passes easy and withdraws 150 cc. of urine. The patient did not think he had been able to empty his bladder as completely as usual.

September 14, 1906.—Letter. Urine is voided naturally eight times during the day and once at night, sometimes not at all, about one pint at a time. No pain. Intercourse is not as satisfactory as before operation. My general health is good. I am cured.

Pathological report.—The specimen, G. U. 226, consists of three pieces, the left lateral, the right lateral and the middle lobes, each in one piece. A fourth piece of tissue which consisted of a portion of the prostatic capsule and the adjacent tissue is also preserved. The entire weight of the prostate is not great. The left lateral: 4 x 3 x 2.5 cm., lobulated, soft. On section dense bands of fibrous tissue are seen between the spheroids. Dilated acini are seen in the larger lobules. Right lateral and median: The right lateral is about the size of the left and is largely composed of one

spheroidal lobule; at one end, however, numerous smaller lobules are seen, and here numerous small hemorrhagic points are present. The middle lobe is about one-third the size of the lateral and much firmer, not lobulated, and the cut surface is composed of small yellowish areas scattered in a fairly dense stroma. Near the periphery a small, round nodule 6 mm. in diameter, yellowish in color, firm and smooth is seen. The tissue removed with the posterior capsule measured 2.5 x 2 x 1 cm., is firm and contains some dilated ducts and small hemorrhagic points.

Microscopic examination.—The hypertrophy is a moderately glandular one, areas fairly rich in glandular acini alternating with areas in which the stroma is very much in excess. The acini are dilated, and the lumina, as a rule, show rather marked endoglandular proliferation, the epithelium often being many layers thick. The stroma as a whole is quite dense, and contains a moderate amount of muscle. There are numerous areas of prostatitis.

In the middle lobe a small nodule encapsulated and of a bright yellow color was noted in the fresh specimen. Section including this area shows the nodule to be a pure adenoma. It is composed of numerous very small alveoli lined by a single layer of epithelium resembling somewhat in character that of a mucous gland. The lumen is small, the epithelium rests on a basement membrane, and the nuclei are at the basal end. Interlacing between the various acini is a rather slender loose connective tissue stroma. The nodule does not resemble in character at all the usual adenomatous areas which one sees in the prostate. Towards the periphery of this lobule the acini are compressed.

Case 127.—*Slight enlargement of lateral lobes. Small pedunculated median lobe. Catheterism. Complication, epididymitis. Cure. Followed five months.*

No. 1139. A. R. W., age 65, married, admitted January 9, 1906.

Complaint.—" Frequency and difficulty of urination."

No history of gonorrhœa.

Present illness began five years ago with slight difficulty and frequency of urination. After that there was a gradual increase in the difficulty, but not in frequency until six months ago when an attack of very frequent urination came on and was associated with pain in the bladder and urethra, after two days he was again comfortable until three months ago, since when urination has been difficult, painful and very frequent. Retention of urine has never been complete, but for the past 10 days' catheterization has been performed once or twice daily, and considerable relief afforded.

S. P.—The patient voids urine every hour until catheterized, and after that not until eight hours have elapsed. There is only slight pain in the bladder, which is relieved by voiding. His sexual powers are normal. General health excellent.

Examination.—The patient is a sparsely built man, but the lips are of good color and there is no arteriosclerosis. Genitalia negative.

Rectal.—The prostate is only moderately enlarged, rounded, slightly irregular, surface firmer than normal, but not markedly indurated. The seminal vesicles are negative, and there is no intervesicular mass, no tenderness, no glands, rectal mucosa not adherent. The prostatic secretion contains a great many pus cells, a small number of lecithins, numerous actively motile spermatozoa.

Cystoscopic.—A catheter passes with ease. The bladder capacity is large, retention of urine is complete. The cystoscope shows a small globular median lobe with a fairly deep sulcus on each side, as shown in the accompanying chart (Fig. 54). By deflecting the handle to the left and depressing it Series U is obtained. In 1 the anterior margin of the prostate alone is seen. By gradually elevating the handle the side of the mid-

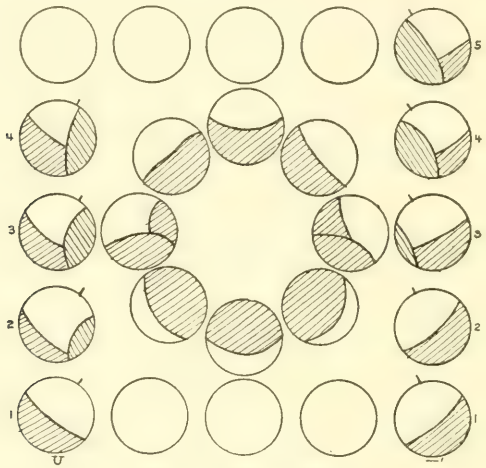


FIG. 54.—Case 127.

dle lobe comes into view in 2 and becomes more and more prominent in 3 and 4. By carrying the handle to the right and going through the same procedures, Series U′ is obtained, the cystoscope descending into the sulcus to the left of the middle lobe. The lateral lobes are only slightly enlarged and there is no sulcus between them in front. The bladder is considerably trabeculated and there is a very large pouch behind the interureteral ligament which is considerably enlarged. The ureters cannot be made out. With finger in rectum and cystoscope in urethra the beak is easily felt, there is no subtrigonal thickening and only moderate increase in the median portion of the prostate.

Urinalysis.—Cloudy, 1014, albumin in small amount, no sugar. Microscopically pus cells in considerable number.

Preliminary treatment.—Urotropin, water in abundance, catheterization three or four times daily.

Operation, January 12, 1906.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were easily enucleated, each in one piece and were only moderately enlarged. The median bar and a small sessile median lobe with a portion of the mucous membrane covering it were removed in one piece through the left lateral cavity. Examination with the finger showed no remaining obstruction. The urethra was torn, and possibly the ejaculatory ducts, but no portion of the ducts were removed. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. The patient stood the operation well. Infusion and continuous irrigation on return to room.

Convalescence.—The patient reacted well. Temperature night following 99°, pulse 90. Continuous irrigation was kept up for 24 hours. The tubes and gauze were removed on the day after the operation. The patient was out of bed on the third day and did well until the 22d day, when there was a rise of temperature to 103.7°, associated with epididymitis on the right side. For a week there was a nocturnal rise of temperature from 100° to 103°, after that it was normal. The left epididymis also became swollen. On this account the patient did not leave the hospital until the 35th day. The perineal fistula closed about the 21st day. On discharge from the hospital on the 35th day, the wound was closed and the patient voided urine at intervals of from one to two hours. The sphincter was a little weak, but there was no definite incontinence.

March 8, 1906.—The patient complains that urination is still frequent and imperative. If he attempts to hold urine too long, a very strong desire to void comes on, and he is unable to retain it. By voiding at intervals of from one to two hours he has no leakage.

Examination.—The wound is firmly healed, silver catheter passes with ease, there is no stricture present, no residual urine, the bladder is irritable and contracted, but able to hold 250 cc. on forcible distention. The patient is instructed to retain urine as long as possible in order to distend bladder.

May 15, 1906.—Letter. I void urine naturally, four or five times during the day and usually twice at night. I suffer no pain. I have imperfect erections, but have not yet attempted intercourse. My general health is very good. I have gained in weight and I consider myself cured.

June 10, 1906.—Since the last report I have improved and "the power for sexual intercourse has been well nigh fully restored."

September 12, 1906.—Letter. I void urine perfectly, four times during the day and twice at night, in normal amounts. I suffer no pain. Sexual intercourse is satisfactory. I am thoroughly cured.

Pathological report.—The specimen, G. U. 233, consists of the three lobes of the prostate removed in four pieces, and weighs about 25 gm. The left lobe is in two pieces, the larger 3 x 2.5 x 2 cm., lobulated, soft, on section showing spheroids, moderate amount of glandular tissue with intervening stroma and one retention cyst 2 mm. in diameter. A few small spheroids are apparently entirely fibrous. The small piece measures 1 x .5 x .5 cm. The right lobe is about the size of the left, is lobulated, soft,

and similar in character to the right, except that there are no fibrous nodules, and several hemorrhagic points are seen. The median portion of the prostate consists of a pedunculated lobe about 1 cm. in diameter, covered with mucous membrane and perched upon a distinct median bar 2.5 x 1.5 x 1 cm. in size. The bar is quite fibrous, but some gland tissue with retention cysts is present. Several seed calculi are seen in the periphery of the bar. The ejaculatory ducts were not removed. No vesical calculus.

Microscopic examination shows a very glandular tissue, in places rather diffuse and in others arranged in lobules. Many of the acini are very much dilated, especially in the lobulated areas with a very small amount of stroma interlacing between them. The lumina of the culs-de-sac are irregular and complex, papillomatous tufts often growing out into the lumen. The stroma is composed of muscle and connective tissue in varying proportions. In areas there has been a great deal of connective tissue hyperplasia and a decrease of gland tissue. There are fairly numerous areas here and there of polynuclear cell infiltration.

The hypertrophy is for the most part a glandular one, although there are a considerable number of areas where the fibrous tissue is in excess.

Case 128.—*Moderate hypertrophy of median and lateral lobes. Catheter for nine years. Cure. No complications. Followed four months.*

No. 1179. W. T., age 80, married, admitted January 15, 1906.

Complaint.—" Prostatic hypertrophy. Catheterism."

No history of gonorrhœa.

Present illness began about 10 years ago with sudden complete retention of urine, requiring catheterization. Examination at that time showed an enlarged prostate, alkaline, purulent urine. Catheterization was necessary six times, but at the end of three weeks the patient was apparently well. The diagnosis of abscess of the prostate was made. One year later retention of urine again, and since then occasional catheterization has been necessary and at times he has suffered considerably from prostatitis.

S. P.—Voluntary urination is possible, but difficult and frequent, the intervals being about two hours. The catheter is used once or twice a day and generally withdraws 10 or 12 ounces of urine. Much more urine is secreted during the night than in the day. Of 60 ounces voided daily often 50 is secreted during the night. He suffers no pain during or after urination, passed no calculi, no blood.

Sexual powers.—Erections and nocturnal emissions occasionally. Sexual powers fairly normal up to a year ago. No intercourse since.

Examination.—The patient is a sturdy looking man with lips of good color. Heart and lungs negative. Pulse 80, regular, no arteriosclerosis. Abdomen negative.

Genitalia.—The right testicle is atrophic, epididymis slightly tender (epididymitis three years ago). There is a small incomplete hernia on the left side.

Rectal.—The prostate is considerably enlarged and the upper end can-

not be reached. The left lobe is rounded, smooth, slightly indurated, but elastic and uniform in consistence. In the anterior portion of the right lobe is a prominent rounded mass about 2 cm. in diameter which projects forward and outward towards the triangular ligament and the consistence is firmer than the rest of the prostate, but it is smooth, and is not adherent to rectum or to surrounding structures. The rest of the right lobe is similar to the left. The seminal vesicles cannot be reached, no enlarged glands are felt.

Urinalysis.—Cloudy, neutral, 1024, no albumin, no sugar. Microscopically pus cells few, no bacteria.

Cystoscopic.—A small coudé catheter passes with ease. There is no roughness or obstruction in the anterior portion of the prostatic urethra, and only 25 cc. residual urine is found (probably an error). The bladder capacity is 250 cc. The cystoscope shows a small pedunculated median lobe with a deep cleft on each side. The lateral lobes are not very large, but form a definite polyp projecting into the bladder. There is no sulcus between them in front. The bladder is moderately trabeculated, slightly inflamed. The right ureter cannot be seen for the median lobe. The left ureter appears normal. With finger in rectum and cystoscope in urethra the beak cannot be felt and the median portion of the prostate is considerably increased.

Operation, January 16, 1906.—Ether. Perineal prostatectomy by the usual technique. The rectum was quite adherent, but the posterior capsule of the prostate was smooth. The prominent lobule projecting from the anterior portion of the right lobe was firm, but not of stony hardness, and did not suggest malignancy, but nevertheless it was thought best to remove with it the capsule and the adjacent urethra without cutting into it. The lateral lobes were easily enucleated, each in one piece. Most of the right lateral wall of the urethra was removed, but the floor and left lateral wall of the urethra and the ejaculatory ducts were preserved. The median lobe was removed through the right lateral cavity and measured 2 x 2 x 3 cm. in size. Examination with the finger in the bladder showed no further enlargement. The wound was closed, as usual, with double tube drainage and light packs for the lateral cavities. Infusion on table, continuous irrigation on return to ward. The patient stood the operation well, pulse at the end 90.

Convalescence.—Patient reacted well. The temperature rising only to 100.4° on the night after the operation and after that normal. The irrigation was discontinued after 12 hours, the gauze removed after 24 hours and the tubes after 48 hours. There was considerable pain and nausea for two days. The patient was up in a chair on the fifth day, and urine came through the anterior urethra on the 11th day. The perineal fistula closed finally on the 17th day, and the patient was discharged on the 23d day. At that time he had no incontinence, but a few drops of urine occasionally escaped if he coughed. He drank much water, and voided about 60 ounces of urine during the night at intervals of an hour. During the day the interval was about three hours, and the total amount much less

than during the night. The stream was large, painless, but there was a slight spasmodic contracture at the end of urination. The wound was firmly closed and his general health excellent.

May 8, 1906.—Letter. The wound has remained healed. I void urine naturally, with perfect ease at intervals of about three hours, and from four to six ounces at a time. My sphincter is still a little weak, especially when I try to hold urine longer than three hours. I have had no erections. My general health is good. I have gained seven pounds and consider myself cured.

September 15, 1906.—Letter returned with a report that patient is traveling in Europe and that he is perfectly well.

Pathological report.—The specimen, G. U. 234, consists of the three lobes of the prostate and weighs 35 gm. The right lobe measures 6 x 3 x 2.5 cm. is lobulated, soft, and on section is succulent and shows fine fibrous bands between glandular lobules. One pin-point abscess is seen. The middle lobe is composed of two pieces, the larger 2 x 2.5 x 1.5 cm. and the smaller 1.5 x 1 x 1 cm. The general appearance is the same as that of the right lobe, except that a few dilated acini are encountered. The left lobe is composed of two pieces about equal in size. One is similar to the right lobe, the other contains a peculiar lobule about the size of a beet, golden yellow in color, distinctly encapsulated. Surrounding the lobule are areas of hemorrhage. A portion of the right lateral wall of the urethra has been removed. The ejaculatory ducts have not been removed; no calculus.

Microscopically the hypertrophy is mostly composed of gland tissue with a moderate degree of dilatation of the acini and cystic degeneration. The epithelium lining of many of the acini shows marked invagination, and is of the usual tall columnar type. In portions of the hypertrophied tissue there is a marked formation of inflammatory tissue, particularly marked about the acini, but also interlacing to a considerable extent into the interstitial tissue. In portions the stroma is largely muscle fibers, many of which are concentrically arranged about the acini, but in other areas, especially those showing most evidence of an old inflammatory process, the connective tissue predominates. The hypertrophy, as a whole, is a distinctly adenomatous one.

Case 129.—*Considerable enlargement of median and lateral lobes. Catheterism three years. Cured.*

No. 1182. M. H., age 55, married, admitted January 24, 1906.

Complaint.—" Catheter life."

Gonorrhœa at age of 18 and 22 years, associated with epididymitis.

Present illness began four years ago with slight frequency of urination and discomfort. Complete retention of urine came on about one year later, was followed by severe cystitis. Since then the patient has catheterized himself at least once daily and of late generally four times a day.

S. P.—The patient catheterizes himself four times a day and can void only a very small amount of urine naturally. He has never suffered pain nor has any dribbling. His general health has remained good.

Sexual powers have become weakened in the past three years, but erections are still firm. Coitus now about once a month.

Examination.—The patient is well nourished with lips of good color. The heart and lungs are negative. Arteries not sclerotic.

Genitalia.—In both groins are scars of former suppurative adenitis.

Rectal.—The prostate is considerably enlarged, especially in the long diameter. The median furrow and notch being obliterated and replaced by a rounded mass. The general contour of the prostate is rounded, smooth, soft, there are no areas of induration, no marked tenderness. The seminal vesicles are negative and no glands are to be felt. Prostatic secretion is composed largely of pus cells, spermatozoa and a few large granule cells present.

Urinalysis.—Slightly cloudy, acid, 1022, no albumin, no sugar, no casts. Microscopically, pus cells and staphylococci.

Cystoscopic.—A large coudé catheter passes with ease and finds 260 cc. residual urine. The bladder is contracted and on forced distension holds only 280 cc. The cystoscope shows a fairly large sessile rounded median lobe with a deep sulcus on each side. The lateral lobes are only slightly intravesically enlarged, and there is no cleft between them in front. The bladder is markedly trabeculated and numerous small pouches are seen. There are no diverticula and no calculi present. The ureters are concealed by the median bar. There is only a slight cystitis. With finger in rectum and cystoscope in urethra it is impossible to feel the beak of the instrument, owing to the thickness and length of the median portion of the prostate.

Operation, January 27, 1906.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were moderately large, soft and easily enucleated. The median lobe was pedunculated and about 4 cm. in diamter. It was delivered into the right capsular cavity and enucleated. The urethra and ejaculatory ducts were preserved. The wound was closed as usual with double catheter and gauze drainage. Patient stood the operation well, pulse at the end being 95. Infusion and continuous irrigation on return to the ward.

Convalescence.—The patient reacted well. The temperature was normal for three days and on the sixth day rose to 104.5°, but rapidly fell to normal again. There was a small stitch abscess on one side of the wound and an abscess in one of the glands in the left groin. During this time the patient had slight fever, never over 102°, and after the 18th day the temperature was normal. The gauze was removed in 24 hours and the tubes in 48 hours. Patient was up in a chair on the third day, and on the fifth day urine passed through the anterior urethra in a large stream, and for two days no urine escaped through the perineum and patient voided at intervals of three hours with perfect control. On the sixth day there was a firm erection of the penis. On the sixth day a small stitch abscess was opened, and on the 18th day a small suppurative adentitis in the left groin was incised. The perineal fistula healed completely on the 24th day and the patient left the hospital on the 31st day. At that time he voided urine

at intervals of five hours and with perfect control, no pain. Urine was clear and contained no bacteria. The general condition was excellent.

May 8, 1906.—Letter. The wound has remained healed. I void urine naturally at intervals of about four hours during the day, and 12 ounces at a time. I retire at 11 p. m. and arise to urinate at 6 a. m. I have erections and satisfactory sexual intercourse, the only difference being that the amount of fluid ejaculated seems less. My general health is very good and I consider myself perfectly cured.

September 15, 1906.—Letter. I void urine perfectly, four times during the day and often not at all at night, 14 ounces at a time. I have no pain. Sexual intercourse is entirely satisfactory. Urine is clear with only an occasional shred and no albumin. I am entirely cured. (The patient, who is a physician, remarks: "Yours is beyond doubt the ideal operation.")

Case 130.—*Moderate hypertrophy of median and lateral lobes of prostate. Catheterism. Attacks of intense pain in back before and after operation. Perineal prostatectomy. Complete relief of urinary symptoms.*

S. No. 18,721. M. L. M., age 60, married, admitted January 31, 1906.

Complaint.—"Prostatic enlargement, pain in the back."

Gonorrhœa 12 years ago, followed by stricture. Six years ago swelling of testicle.

Present illness began six years ago with frequency of urination. There was also considerable difficulty and at times much straining required. Since then there has been a gradual increase in the difficulty, but during the past year he has been very much worse, and has had to void at intervals of from one and one-half to two hours with considerable straining which has produced hemorrhoids and pain on defacation. For the past two and one-half years there has been slight dribbling of urination. Two weeks ago urination became very difficult and painful, and there was an intense pain in the back. His physician catheterized him and drew off a large amount of urine, and since then the catheter has been passed twice daily. He has continued to suffer severe pain constantly in his back which has been pronounced lumbago. Any sudden movement produces severe paroxysms of pain in the lumbar region. He has had no paralysis of any sort, but the pain has been confined to the back.

Status præsens.—Urination very difficult, painful, very frequent. Catheterization twice daily. Severe constant pain in the lumbar region. The patient cannot move legs or body without very great pain. Sexual powers present, but erections are painful and intercourse produces slight pain. General health excellent, no loss of weight.

Examination.—The patient is well nourished and his lips are of good color. There are no enlarged glands. The lungs and heart are negative. The arteries are considerably sclerosed.

Abdomen.—There is no tenderness in the region of the kidneys or bladder. Patient locates pain in the lumbar region on both sides and in the spinal column. There is no tenderness along the spine, but any movement or sudden jar causes severe pain in this region. Genitalia negative.

Rectal.—The prostate is moderately enlarged, smooth, firm, but not of stony hardness. There is slight induration in the region of the seminal vesicles, but not sufficient to suggest cancer. There are no enlarged glands in the pelvis, the rectum is smooth and soft.

Cystoscopic.—Coudé catheter passes with ease and withdraws about 400 cc. residual urine. The bladder is slightly contracted and irritable. The cystoscope enters with ease, but there is some hemorrhage, making examination somewhat unsatisfactory. The middle lobe is moderately enlarged, and the lateral lobes are only slightly intravesically enlarged. There is no stone present.

Urinalysis.—Acid, 1020, no sugar. albumin in small amount. Microscopically pus cells, bacilli, no casts.

Operation, February 2, 1906.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were moderately enlarged and removed each in one piece. The median lobe came away in three pieces, and was moderately enlarged. There was no stone present. The ejaculatory ducts were not removed. The wound was closed as usual with double tube and gauze drainage. The patient stood the operation well, the pulse at the end being 85. The patient reacted well, temperature rose to 101° on the first two days after the operation, after that remained normal. The gauze and tubes were removed in 48 hours, and on the third day considerable urine passed through the anterior urethra. On the third day the following note was made: The patient voids urine three times a day. He has control sufficiently good so that he can use the commode. His general condition is excellent. For one week after the operation he was almost free from pain in the back, on the eighth day he had several attacks of pain in the lumbar region which caused him to cry out and double up. The perineal fistula closed on the 20th day, and patient at that time voided urine at intervals of five hours and had perfect control. He was confined to bed, however, owing to severe paroxysmal pains in the lumbar region. The patient described the pain as throbbing in character and located in the back bone. It radiated only once down the right leg, there was no constriction like pain, no girdle sensation, no numbness, tingling or weakness in the legs. Any sudden motion, turn or jar, coughing or sneezing, produces the pain. The attacks come on some days at intervals of from 15 to 20 minutes and last from two to three minutes. During this time the patient is drawn up, legs and thighs flexed, and the abdominal muscles are rythmically contracted and relaxed with the pain. Examination shows no sensory or motor disturbance in legs, thighs or abdomen. There is no incontinence of urine or feces. The reflexes at the knee and ankle are exaggerated equally on both sides. There is no point of tenderness along the spine. The patient was discharged at his own request on the 21st day. He still continued to suffer severe attacks of pain as described above. He was able to retain urine for five hours, and had no difficulty in urination, no pain in the bladder nor urethra. An x-ray examination of the spine was negative.

Note.—The pain in the back was very puzzling in character, and suggested somewhat spinal tumor, but examination was negative in every way.

September 18, 1906.—Letter. I void urine naturally at intervals of three or four hours during the day and two or three times at night. I am getting along fairly well, but don't get strength in hips and back. After three or four hours of work or exercise I have to lie down. I suffer pain in my hips except when sleeping. I do not have erections. My general health is fair and I have gained 25 pounds. The perineal fistula has remained closed, and I am cured.

Pathological report.—The specimen, G. U. 240, consists of the right, left, and median lobes of the prostate, and weighs about 30 gm. The right lateral lobe measures 6 x 2.5 x 2 cm. Its surface is composed of numerous small spheroids bound together by a thin capsule. It is soft and on section is very succulent and shows great numbers of small and large spheroids with little intervening tissue. There are numerous small yellowish areas, evidently necrotic epithelium. There are numerous dilated acini. The left lateral lobe measures 4 x 3 x 2.5 cm. and is similar to the right. The middle lobe is in three pieces, the largest 2.5 x 2 x 2 cm., and similar in character to the lateral lobes. No mucous membrane, no ejaculatory ducts, no calculi.

Microscopic examination.—Microscopically, the gland tissue distinctly predominates. The acini are in part moderately dilated, in other portions have undergone cystic degeneration, while in still other areas the acini are about normal in size. In a few areas the epithelium seems to grow into the lumina of the acini in a rather loose irregular manner, but nowhere showing any tendency to infiltrate the surrounding stroma. Both in the lobulated areas and in the intervening portions, there is a fair amount of chronic prostatitis leading in many places to the formation of new connective tissue about the acini, and often infiltrating in an irregular manner the interstitial stroma. The stroma contains a fair amount of muscle fibers.

Case 131.—*Considerable enlargement of median and lateral lobes. Suprapubic fistula of two years' duration. Cured.*

No. 1195. J. T. H., age 74, married, admitted February 8, 1906.

Complaint.—" Prostatic obstruction, suprapubic fistula."

Patient had gonorrhœa as a boy, no complications or stricture afterwards.

Present illness began 15 years ago with frequency of urination, after that there was a gradual increase in frequency and difficulty, and hematuria appeared once six years ago, there has been none since. About two years ago, at which time patient was getting up five or six times at night to urinate, acute retention of urine came on, he could not be catheterized and suprapubic cystostomy was performed. Numerous vesical calculi were removed. Previous to this he had had no pain in the bladder. The suprapubic sinus has been kept open, and he now wears a small rubber catheter, but is bothered considerably with leakage.

Status præsens.—Does not void naturally, wears a suprapubic catheter. No pain, no hematuria, no loss of weight. General health is excellent.

Sexual powers.—No erections for several months.

Examination.—Healthy looking man with marked arcus senilis. Lips are of good color. The lungs are negative with the exception of a few râles. The heart is negative. Arteries sclerotic. The abdomen is negative with the exception of suprapubic fistula through which urine escapes. Urine, sp. gr. 1021, neutral, no sugar, moderate amount of albumen. Microscopically, pus, red blood corpuscles, numerous organisms.

Genitalia.—Both epididymes are enlarged, indurated and tender.

Rectal.—The prostate is considerably hypertrophied, about the size of a small orange. It is smooth, firm, but elastic. There are no areas of induration and no tenderness. Extending upward and outward from the upper end of each lateral lobe is an area of induration in the region of the seminal vesicle which is more extensive on the left than on the right. This induration is not of stony hardness, but is quite firm and the surface is a little irregular. On the left side there is a line of induration which extends back along the lateral wall of the pelvis towards the sacral fossa. No enlarged glands can be felt. In the intervesicular space there is a pleateau of moderate induration continuous with the vesicles on each side and with a sharp concaved upper border.

Remark.—The prostate does not suggest malignancy, and while the distribution of the induration in the region of the vesicles and intervesicular space suggests carcinoma, the induration is of less degree than we have seen in such cases.

Cystoscopic.—A coudé catheter passes with ease, and, by stopping up the suprapubic fistula, cystoscopy is possible, but not very satisfactory on account of hemorrhage. The cystoscope shows a median lobe of considerable size, and also a moderate intravesical enlargement of the lateral lobes.

Operation, February 9, 1906.—Ether. Perineal prostatectomy by the usual technique. The prostate was markedly adherent to the rectum and freed with difficulty. The lateral lobes were considerably enlarged and were enucleated each in one piece with the exception of a small anteriorly projecting portion of the right lobe. The median lobe, which was quite large, was drawn into the right lateral cavity and enucleated with ease, small area of mucous membrane being excised with it. Examination with the finger showed no remaining prostatic enlargement, and no calculus. Closure as usual with gauze and double tube drainage. Infusion on the table and continuous irrigation on return to ward. The patient stood the operation well, his pulse at the end being 105°.

Convalescence.—There was no elevating of temperature and pulse following the operation, but after the fourth day there was a slight up and down temperature, and on the tenth day a chill and temperature of 104°. On the 14th day there was another chill and temperature of 103°, but after the 16th day the temperature remained normal. The irrigation was kept up for 10 hours, gauze and tubes were removed at the end of 24 hours. On the third day a small quantity of urine passed through the penis, but

most of it escaped through the suprapubic fistula. The perineal sutured wound suppurated and broke down on the left side, and several pieces of necrotic capsule of prostate came away. This was the cause of the fever mentioned above. The perineal fistula closed on the 30th day, and the suprapubic wound on the 34th day. The patient was discharged on the 43d day, able to retain urine for three hours and voiding sometimes as much as 400 cc. at a time, 2000 cc. in 24 hours. There was slight leakage if patient had to hold urine long after desire to void came on.

Rectal.—The seminal vesicles are indurated, not of stony hardness and not nodular. They are softer, elastic and compressible. The intervesicular induration does not suggest malignancy. In the region of the prostate a small, rounded mass, smaller than normal prostate, is felt. There are no enlarged glands. Patient is in excellent condition.

September 22, 1906.—Letter. I void urine naturally about every two hours, two or three times at night, two or three ounces at a time, but suffer no pain. I have not had erections for two years. Physician reports that the fistula is completely closed.

Pathological report.—The specimen, G. U. 245, consists of the three lobes of the prostate, each removed in one piece, and weighs in all about 40 gm. The left lobe measures 5 x 3 x 2 cm., is lobulated, firm, but elastic, and on section is very juicy. There are numerous spheroids, some dilated ducts, one retention cyst containing greenish material, and about 1.5 cm. in diameter. The right lateral and middle lobes have been removed in one piece, the right measuring 3.5 x 2.5 x 2.5 cm., is larger than the other two lobes measuring 5 x 3 x 3 cm. It is considerably torn, composed of numerous large lobules, and contains some mucous membrane on its anterior surface. On section it is similar in character to the lateral lobes. The ejaculatory ducts have not been removed, no calculus.

Microscopic examination.—This hypertrophy is also of the benign adenomatous type. The glands show very marked complexity, owing to invaginations of the wall and papillomatous outgrowths. In areas there is moderate cystic dilatation. In some of the glandular lobules the acini are small, closely grouped with a rather small amount of stroma. In the areas outside of the lobules the stroma is quite dense, and contains a great deal of fibrous tissue with numerous areas of chronic inflammation. Within the lobules there are also limited areas of periacinous and round cell infiltration. The stroma contains somewhat more fibrous than muscle tissue. The same type of hypertrophy is present in all three lobes.

Case 132.—*Moderate hypertrophy of median and lateral lobes. Catheterism. Cured. Followed three months.*

No. 1201. M. S., age 67, married, admitted February 10, 1906.

Complaint.—" Frequency of urination."

No definite history of gonorrhœa, but had a discharge 10 years ago.

Present illness began about 11 years ago with frequency of urination. This gradually increased until three months ago when he had to urinate six times during the night and occasionally had dribbling. He has had

no pain except a burning during urination. For the last two weeks urination has been very frequent, considerable pain in the bladder.

Sexual powers.—Erections and desire have been absent for 10 years.

Examination.—Patient is a well nourished man, but looks sick. Lips of fair color. The chest and abdomen are negative.

Rectal.—The prostate is moderately hypertrophied, smooth, round, elastic, not very painful. At the upper end of the left lateral lobe is a small rounded, prominent nodule, smaller than a cherry, which is harder than the rest of the prostate. It does not seem to be continuous with the seminal vesicle, both of which are soft and not surrounded by adhesions.

Cystoscopic.—A coudé catheter passes with ease and finds 400 cc. residual urine. The cystoscope shows two moderately enlarged lateral lobes with a deep sulcus between them in front, and a median bar of small size connecting the two without intervening sulci. The examination of the bladder is unsatisfactory on account of hemorrhage.

Urinalysis.—Acid, 1010, albumin in small amount, microscopically many red blood corpuscles and some pus cells, no bacteria.

Preliminary treatment.—The patient was catheterized twice daily, about 300 cc. residual urine being found each time. Several hours after catheterization he is able to void small amounts with difficulty and great frequency. Urotropia and water in abundance given.

Operation, February 14, 1906.—Ether. Perineal prostatectomy by the usual technique. The posterior surface of the prostate was moderately enlarged. The lateral lobes were easily enucleated without tearing the urethra or bladder. A small median bar was present which was continuous with two small lateral masses which together formed a collar around the prostatic urethra. It was quite adherent and enucleated in three pieces through the two lateral cavities without removing any mucous membrane or destroying the ejaculatory ducts. There was very little hemorrhage and the patient stood the operation well. The wound was closed as usual with double catheter drainage and light packs for the lateral cavities. Patient stood the operation well, pulse at the end 75. Infusion and continuous irrigation on return to the ward.

Convalescence.—The patient reacted well. The temperature rose to 102° on the third day after the operation, and for ten days there was a slight daily rise to 101°, after that the temperature was normal. The gauze and tubes were removed on the second day. On the third day after the operation epididymitis developed on both sides, but was only slight in character and subsided after a week. The fistula healed very slowly and the patient was not discharged until the 40th day. He was then able to retain urine for several hours and felt well.

May 15, 1906.—The patient returns for examination. He voids urine three times during the day and twice at night, in a large stream without pain or incontinence. The perineal fistula healed on the 90th day. For two years previous to the operation the patient had no erections. During the past two weeks he has had several firm erections, and nocturnal pollutions.

Examination.—The patient looks well. A catheter passes with ease and finds 20 cc. residual urine. The bladder is large, admitting 400 cc. of fluid. The urine is acid, contains pus and bacilli. The perineal wound is closed. There is no stricture present.

July 12, 1906.—A catheter passes with ease, there is no residual urine, bladder capacity 375 cc.

September 14, 1906.—The perineal wound has been healed for some time. Patient voids from two to four times during the day and once at night. Urination normal. Erections are present.

Pathological report.—The specimen, G. U. 247, consists of the two lateral lobes and a median lobe, the latter in two pieces, and weighs about 20 gm. The left lobe is the larger and measures 3 x 2 x 2.5 cm., has a lobulated surface, is firm, but elastic. The section presents the typical picture of a glandular hypertrophy, but with well marked fibrous bands. The right lobe measures 2.5 x 2 x 2 cm., and has the same general appearance as the left. Four small seed calculi are present along its inner surface. The middle lobe consists of three small pieces, the largest of which is 2 x 1 x 1 cm., and on section is similar in appearance to the lateral lobes. A small bit of mucus is attached.

Microscopic examination.—Both lateral lobes contain stroma and gland tissue in varying amount, the gland tissue for the most part predominating. The alveoli in the glandular areas show but moderate dilatation, except in a few areas where there is rather marked dilatation with intracystic papillomatous outgrowth, giving the appearance of numerous acini with slender bands of stroma. The stroma is rather dense as a whole, and contains more fibrous than muscle tissue. Limited areas of prostatitis with interstitial and glandular infiltration of a rather mild type are present. The median bar contains practically no alveoli, and consists for the most part of fibrous tissue. Here and there evidences of new formed connective tissue with vestiges of gland acini are to be noted.

The hypertrophy in the lateral lobes is a glandular one, while the median bar is fibrous.

Case 133.—*Small prostate. Slight median bar. Residuum 360 cc. Cure. Followed three months.*

No. 1204. R. L. S., age 47, married, admitted February 13, 1906.

Complaint.—" Frequency and difficulty of urination."

No history of gonorrhœa. At the age of 15 the patient fell astride of a fence, had no hemorrhage from the urethra, but several months later noticed that the urinary stream was smaller than normal, this continued up to P. I.

Present illness began about 10 years ago with increase frequency of urination, and after four years he had to strain very severely during urination and make numerous efforts before urine was voided to afford relief. His physician then performed internal urethrotomy for a stricture one inch from the meatus, but the difficulty in urination was not bettered. During the past four months he has been much worse and has suffered

pain in the hips and lower portion of the back. Two years ago he had retention of urine for four days and required catheterization, but no instruments have been passed since that time.

S. P.—Urination every hour night and day. Stream small, considerable straining necessary, never any dribbling. Burning along the urethra during urination, no hematuria, no severe pain.

Sexual powers.—Good until six months ago, since then has had no erections and no sexual desire. Patient has not lost weight.

Examination.—The patient is a pale, thin, frail looking man. The lungs are negative.

Heart.—There is a slight systolic murmur at the apex and the heart is a little enlarged. The arteries are thickened, pulse 75, tension high. Abdomen and genitalia negative.

Rectal.—The posterior surface of the prostate does not appear to be enlarged. It does not bulge towards the rectum, is soft, smooth and free from nodules. The seminal vesicles seem atrophic and are barely palpable against the posterior surface of the bladder which appears distinctly thickened. The rectal sphincter is strong, there are no enlarged glands.

Urinalysis.—Cloudy, acid, 1007, albumin in small amount, no casts, pus and bacilli in considerable amount.

Cystoscopic.—A large bougie-à-boule detects stricture of large caliber about five inches from the meatus. A No. 12-F bougie passes with ease and enters the bladder. Filiforms pass without difficulty and followers up to 22-F. A small rubber catheter is then introduced and finds 360 cc. residual urine. The cystoscope shows no enlargement of the lateral lobes, and a very small, slightly rounded enlargement of the median portion of the prostate. There is a definite but shallow cleft on each side of the middle lobe and a small pouch behind it which cannot be explored with the cystoscope. The ureters are situated in hypertrophied ridges and are easily seen. The lateral and posterior surfaces of the bladder are markedly trabeculated, with numerous small and large cellules. At the vertex of the bladder a large, irregular, dark opening, probably the orifice of a large diverticulum, is seen. With finger in rectum and cystoscope in urethra a slight but definite increase in the median portion is made out.

Preliminary treatment.—Catheterization three times daily for two days. Urotropin and water in abundance. 450 cc. residual was found.

Operation, February 15, 1906.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were no larger than normal, but were enucleated each in one piece with some difficulty. Each measured about 1½ cm. in diameter. It was impossible with the tractor to engage the median portion of the prostate. The urethra was therefore opened along its left lateral wall and the finger inserted into the bladder after dilating a markedly constricted prostatic orifice which seemed to be surrounded by a fibrous ring. It was impossible with the finger to expose the median portion of the prostate, and a long forcep was used to grapple it. After that the median portion of the prostate, with the mucous membrane covering it, was excised with a small strip of the left lateral margin of the

prostate. The tissue removed measured from 5 mm. to 1 mm. in diameter and about 2 cm. in length. That representing the median portion was white and fibrous, that representing the lateral was muscular. After this excision a very large prostatic orifice was present. Examination with the finger showed no remaining prostatic obstruction. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. The patient stood the operation well, infusion and continuous irrigation on return to the ward.

Convalescence.—The patient reacted well. Temperature rose to 101.8° on the day after the operation, but after that it remained practically normal. The gauze and tubes were removed on the day after the operation and the patient was out of bed on the third day. Urine began to flow through the penis on the sixth day and the perineal fistula closed finally on the 17th day. Interval urination was established seven days after the operation, and he has had no incontinence since. He was discharged from the hospital on the 20th day. At that time he was able to retain urine four or five hours, voided without difficulty, hesitation and in a large stream. The wound was closed. No. 28 sound passed into the bladder with ease without detecting any stricture. A silver catheter found 10 cc. residual urine.

March 12, 1906.—Letter. Urination is normal. I feel better than I have for years. Erections have returned and sexual desire is strong.

May 8, 1906.—Letter. I void urine naturally and easily at intervals of four hours during the day and seven hours at night, about a pint at a time. I have no pain. Sexual intercourse is entirely satisfactory, being apparently normal in every respect.

September 12, 1906.—I void urine naturally three or four times during the day and none at night in normal amounts. I suffer no pain. Sexual intercourse is satisfactory. I am perfectly cured.

Pathological report.—The specimen, G. U. 248, consists of three small bits of tissue representing the three lobes of the prostate, and weighs less than 5 gm. The lateral lobes consist each of a small mass about 1 cm. in diameter, and appear to be composed largely of fibrous tissue. There are no spheroidal lobules, and the picture does not resemble that of ordinary hypertrophy. The median portion measures 4 x 1 x .5 cm., the larger end is white and fibrous, the other half apparently muscle (vesical). The mucous membrane is not visible. Ejaculatory ducts not removed, no calculus.

Microscopic examination.—The section from the median bar shows largely fibrous tissue with here and there atrophic looking acini. About nearly all of the acini there is a well marked periacinous inflammatory infiltration, which often extends well out into the interstitial tissue. The stroma is mostly made up of fibrous tissue, although here and there one finds areas where considerable smooth muscle is present. The appearance, both microscopically and macroscopically, is that of normal prostatic tissue which has undergone considerable inflammatory change.

CASE 134.—*Slight enlargement of lateral lobes. Small median lobe. Intermittent complete retention. Symptoms suggesting tabes. Cure.*

No. 1230. S. H. S., age 62, married, admitted March 6, 1906.

Complaint.—"Difficulty in urination. Catheterism."

Several attacks of gonorrhœa in early manhood with posterior involvement. Twelve years ago had marked polyuria for one year. During this time he would void from six to eight quarts of urine a day. After that had weakening of sexual powers. Absence of satisfactory ejaculation. Eleven years ago a sound was passed by a physician, and on the next day the patient went into a coma and was unconscious three days and three nights. No attacks of unconsciousness since, but double vision persisted for six months after the attack.

Present illness.—It is difficult to state the time of onset. For the past 12 years patient has arisen at least once at night to urinate, and the stream has been smaller and normal. There has never been any incontinence. Knee jerks were absent on examination 10 years ago, but there has been no unsteadiness of gait nor swaying when washing face. Never any pain in limbs. His urinary trouble has gotten gradually worse, but he did not have complete retention of urine until eight months ago when he was catheterized for the first time. Since then he has been catheterized for short periods four or five times with intervening periods of fairly free urination. During the past three months he has had a fairly constant dull pain in the hypogastric region with occasional sharp exacerbations in which it would radiate into the groin; no pain in back, testicles or limbs. No note of hematuria or pain in the urethra.

Status præsens.—Frequency of urination, particularly during the night (twice). Practically no increase in frequency during the day. Stream small and slow (considerable effort required). Dull pain in hypogastric region. Occasional retention requiring catheterization, three pints being withdrawn. No difficulty in walking in the dark, no lancinating pains.

Sexual powers.—Ejaculations have been absent for 10 years. Sexual desire has gradually decreased and during the past year has been absent, and there have been no erections. The patient has lost 20 pounds during the past four months, but he feels well.

Examination.—Patient is fairly well nourished with lips of good color. The pupils are equal and react to light and accommodation. The knee jerks are not obtained naturally nor on reinforcement. There is no ankle clonus. When patient stands with eyes closed and head elevated there is a decided swaying of the body. The co-ordination of the arms and legs are good. The heart, lungs and abdomen are negative.

Genitalia.—The left epididymis is indurated, but very little enlarged. There are no enlarged glands present.

Rectal.—The prostate is moderately enlarged, forming a globular mass about the size of a small orange, the lateral lobes being equally enlarged, and the median furrow and notch being absent. The prostate is smooth, firm, elastic. There are no nodules or areas of induration present. The seminal vesicles are negative. There is no intervesicular mass, no tenderness and the rectum is normal.

Urinalysis.—Acid, 1012, albumin in small amount, no sugar, pus and bacilli in moderate number.

Cystoscopic.—A coudé catheter passes with ease and finds 400 cc. residual urine, and a bladder capacity of 550 cc. There is no stricture present. The cystoscope shows a very slight intravesical enlargement of the lateral lobes and a prominent pedunculated median lobe with a deep sulcus on each side, particularly the left. The bladder is only slightly inflamed. The right ureter is easily seen, but the left is obscured by the middle lobe. There is no stone present. With finger in rectum and cystoscope in urethra, the beak is easily felt and the median portion of the prostate is only slightly thickened (with the instrument in a sulcus to the left of the lateral lobe).

Remark.—The history of this case is peculiar, and suggests tabes, but the absence of lightning pains and eye symptoms seem to exclude this, and the presence of definite hypertrophy, particularly of the median lobe, offers sufficient explanation for urinary symptoms, difficulty of urination, straining, occasional complete retention. The patient's desire for relief seems warranted and operation was decided upon.

Operation, March 9, 1906.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were only moderately enlarged, and each was removed in several pieces. A small globular median lobe about 2½ cm. in diameter was enucleated through one of the lateral cavities without destroying the ejaculatory ducts. The wound was closed as usual with tubes and gauze drainage. The patient stood the operation well. Pulse good at the end. Submammary infusion on return to the ward.

Convalescence.—The patient reacted well. The irrigation was discontinued after 12 hours, the gauze and tubes were removed on the day after the operation, and the patient was up in a chair on the third day. On the second day the urine passed through the penis at intervals, and on the sixth day the patient was able to retain urine for four hours, and had no pain. The perineal fistula closed finally on the 22d day, and the patient left the hospital on the 24th day in excellent condition, able to retain urine for three hours, no dribbling or other complications. On the 27th day examination showed the wound healed, a catheter passed with ease and found only 5 cc. residual urine. Rectal examintion showed no induration in the region of the seminal vesicles. Urine was acid and contained bacilli in moderate number. Patient was able to retain urine for four hours and had no incontinence.

May 9, 1906.—Letter. I am doing finely and feel like you have given me a new lease on life. I have perfect control and am very well.

September 14, 1906.—Letter. I void urine three or four times during the day and once at night, about eight ounces at a time. I have had no erections, but these were absent before operation. Have gained 20 pounds in weight and am perfectly cured.

Pathological report.—The specimen, G. U. 254, consists of three lobes of the prostate removed in five pieces, and weighing about 18 gm. The left

lobe is a mass 2.5 x 1.5 x 1 cm., soft and on section very succulent and contains numerous retention cysts and dilated ducts. Spheroidal arrangement of the tissue is indistinctly shown. The middle lobe is about the same size as the left, is firm, but elastic, and on section rather homogeneous in appearance. The ducts are dilated, and there is no spheroidal arrangement. The right lobe consists of five pieces, the largest of which is 4 x 2 x 1.5 cm., and is lobulated. The small pieces are homogeneous but soft, and there are no dilated acini. No mucous membrane, no ejaculatory ducts, no calculus.

Microscopic examination.—The hypertrophy of the left lobe is of a glandular type with dilatation and cystic degeneration of the acini. There is present, however, a rather large amount of stroma.

In the middle and right lateral lobes, the hypertrophy is of a rather fibro-muscular type, the different acini being separated by rather broad bands of stroma. In the latter two lobes the acini are somewhat dilated, but their lumina are comparatively regular, there being but few projections from the lining wall. About many of the acini there has been formed concentric layers of new inflammatory tissue, which is producing compression. The stroma shows a fair amount of round cell infiltration, and there is present a large amount of muscle. The arteries exhibit very little if any thickening. We have here a hypertrophy of the fibro-muscular type in the middle and right lateral lobes, while the left is a glandular one.

Case 135.—*Moderate hypertrophy of median and lateral lobes. Two vesical calculi. Catheterism. Cure. Recent case.*

S. No. 18,978. W. C. L., age 62, married, admitted April 3, 1906.

Complaint.—"Prostatic trouble."

No history of gonorrhœa.

Present illness began six years ago with difficulty of urination. Since then there has been a gradual increase in the difficulty and frequency, there has been considerable straining and the stream has become small. Fifteen months ago, following a horseback ride, he had hematuria once, and a second attack four months later. His physician says that he had two attacks of renal colic, characterized by acute pain in the left kidney radiating into the left groin, requiring morphia first 21 months ago and second 9 months ago. During the past nine months hematuria has been frequent, and there has been intense pain at the end of urination along the urethra. He has not had complete retention of urine, but for the past four weeks has used the catheter twice daily, but has never evacuated more than half an ounce of residual urine.

Status præsens.—Urination about every hour night and day. Considerable difficulty, pain, occasionally hematuria. No loss of weight. Uses catheter twice daily, but finds very little residual urine.

Sexual powers.—No note made.

Examination.—The patient is quite fat, his lips are of good color. The lungs are negative. The heart is enlarged and there is a slight systolic murmur at the apex. The abdomen is negative.

Rectal.—The prostate is moderately enlarged, smooth, firm, no nodules or areas of marked induration.

Cystoscopic examination.—A catheter passes with ease and finds 200 cc. residual urine. The bladder is contracted and irritable, and examination produces hemorrhage, rendering cystoscopy unsatisfactory.

Urinalysis.—Cloudy, acid, 1021, no sugar, albumin in small amount, microscopically, pus cells, bacteria, a few granular casts.

Operation, April 5, 1906.—Ether. Perineal prostatectomy by the usual technique. Lithotomy.

The lateral lobes were moderately enlarged and were removed each in one piece. The middle lobe, which measured about 3 cm. in diameter was removed through one of the lateral cavities, a small piece of mucous membrane being excised. The floor of the urethra and ejaculatory ducts were preserved intact. The urethra was divided along the lateral wall, and the neck of the bladder dilated, and two small, oval calculi removed. The wound was closed as usual with double tube and gauze drainage. The patient stood the operation well, pulse at the end being 95.

Convalescence.—For two days after the operation his temperature rose to 101°, but after that was normal. The irrigation was discontinued at the end of 12 hours, tubes removed at the end of 30 hours and the gauze at the same time. The patient was up in a chair on the third day, urine began to flow through the urethra on the sixth day. The fistula closed on the 16th day, and the patient was discharged from the hospital on the 19th day. At that time he was able to retain urine for two hours, voided without pain and in a large stream, had no incontinence, but slight precipitancy, and had had no complications and no instrumentation.

June 14, 1906.—Letter. I void urine fairly naturally from one-quarter to one-half a pint at a time. I have no pain. My general health is good. The wound has remained closed and I consider myself cured.

September 14, 1906.—Letter. The perineal fistula closed about five weeks after the operation. I void urine naturally, six or eight times during the day and seldom more than once at night, about three-fourths of a pint at a time. I have had no erections. My general health is good, "am nearly cured."

Pathological report.—The specimen, G. U. 261, consists of the three lobes of the prostate, each of which has been removed in one piece, and weighs about 20 gm. The right lobe is an oval mass 3 x 2 x 2 cm., elastic, lobulated, and on cross section shows numerous retention cysts, a few small calculi in the periphery, and as a whole is quite glandular. The left lobe is about the same size as the right, is also elastic and on section shows numerous spheroidal bodies firm in consistency and yellowish in color, with a considerable amount of stroma. The middle lobe measures 3 x 2.5 x 2 cm. Attached to its upper end is a small piece of mucous membrane. It is lobulated, elastic and on section appears very glandular. There are no areas suggesting carcinoma. Seed calculi are present in all of the lobes. The ejaculatory ducts have not been removed. Two oblong

stones, each about 1.7 x 1.3 x 1 cm. with smooth, white surfaces, have been removed.

Microscopic examination.—The hypertrophy is a distinctly glandular one with arrangement in lobules. The acini are for the most part small, but show very active proliferation, there being present very numerous intraacinous projections. Often in the glandular areas the stroma separating the acini is very delicate, and apparently consists almost entirely of fibrous tissue. The epithelium lining the acini varies a great deal, portions of acini having but a single layer of high columnar cells, in other points the epithelium is many layers thick, the superficial layer being of the tall, columnar variety. The branching and union of the papillomatous outgrowths give the appearance of a great increase in the number of acini. The stroma is for the most part composed of connective tissue, although here and there areas are encountered where there is a definite amount of smooth muscle. There is no evidence of prostatitis in sections examined. The arteries seem about normal.

CASE 136.—*Moderate enlargement of lateral and median lobe. Residual urine 600 cc. Cured. Recent case.*

S. No. 18,993. P. C. G., age 69, married, admitted April 7, 1906.

Complaint.—" Incontinence of urine."

No history of gonorrhœa. Since early manhood the patient has had to arise two or three times at night to urinate. There has been no increased frequency of urination in recent years. Two years ago he began to have incontinence of urine every night, there was no incontinence during the day and no increased frequency of urination, but micturition was imperative when the desire came on. His condition has remained about the same for two years.

S. P.—Micturition at intervals of three or four hours during the day. Wets the bed every night. A sharp pain comes on just before urination, increases during the act and is particularly bad at the end and disappears after urination. Occasionally a dull ache in the back. No pain in rectum, hips, thighs, legs, groins or testicles. No hematuria, no calculus, no loss of weight.

Sexual powers.—Has had no erections for two years.

Examination.—The patient is well nourished with lips of good color. Chest and abdomen negative.

Genitalia.—Negative.

Rectal.—The prostate is moderately enlarged, forming a globular mass about 6 cm. in diameter. It is smooth, soft, elastic, no nodules, no tenderness. The seminal vesicles are soft, there is no perivesicular induration, no glands, no cords.

Cystoscopic.—Catheter passes with ease and withdraws 580 cc. residual urine. The cystoscope shows very little enlargement of the right lateral lobe, a larger left lateral lobe and a pedunculated intravesical lobe which springs from the base of the left lateral lobe, in other words a left-sided

median lobe. The bladder is considerably trabeculated. There is no stone present.

Urinalysis.—Clear, acid, 1010, no sugar, a trace of albumin, a few coarsely granular casts.

Operation, April 14, 1906.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were moderately hypertrophied. The right was quite adherent to the urethra and was removed in two pieces. The left was removed in one piece. The median lobe was enucleated through the left lateral cavity, it was moderately enlarged. The urethra was torn, but none was removed, and the ejaculatory ducts were preserved intact. Closure as usual with double tube and gauze drainage. The patient stood the operation well. Pulse at end 75. Infusion on return to the ward.

Convalescence.—The patient reacted well. The temperature rose to 101° on the night after the operation, but rapidly fell to normal and remained so after the second day. The gauze and tubes were removed on the first day. He was up in a chair on the second day. Urine passed through the anterior urethra on the 16th day, and he was discharged on the 24th day. There was still a pin-point fistula in the perineum, but he voided urine easily and without pain. His general condition was excellent.

June 7, 1906.—Letter. The perineal wound is not quite closed, and a small amount of urine escapes from it. I am free from pain and pass about half a pint of urine at a time, three or four times during the day and night. My general health is good, and I have gained in weight.

September 16, 1906.—The perineal fistula has never closed and a good deal of urine escapes through it. I void urine five or six times during the day and three times at night, the largest amount at one time being one-half to one pint. I do not have erections. My general health is good, and I have gained in weight.

Pathological report.—The specimen, G. U. 277, consists of two lateral lobes of about equal size and a median lobe which is somewhat smaller. The total weight is 25 gm. All three lobes are soft and elastic in consistency, the surface is lobulated, and on section a considerable amount of milky fluid exudes. The tissue is mostly composed of lobules within many of which the ducts are dilated.

Microscopic examination.—The hypertrophy is a lobulated glandular one. The acini vary in size, some presenting a considerable degree of cystic degeneration, while others are normal. Active proliferation seems to be in progress and frequently several acini, apparently the descendants of a single acinus, are seen. The lumina of the culs-de-sac are serrated, due to infolding and knuckles of epithelium often without any stroma pedicle. The stroma apparently contains considerable newly formed connective tissue, and the connective tissue element is considerably in excess of the muscle. The arteries seem about normal. There is no prostatitis present. Although in this prostate there are a number of areas where proliferation is very active and intraacinous papillomatous projections are seen, nowhere is any evidence of carcinomatous tendency displayed.

CASE 137.—*Age 37, with signs of obstruction to urination since early boyhood. Small inflammatory prostate with obstructive median bar and 440 cc. residual urine. Perineal prostatectomy, excision of median bar. Cure. Recent case.*

No. 1278.—H. W. R., age 37, single, admitted April 28, 1906.

Complaint.—"Frequency and burning on urination."

No history of gonorrhœa or masturbation.

The patient has had frequency of urination since his earliest recollection, but his first recollection of difficulty of urination was at the age of eight years. At that time he remembers that during recess he would not be able to urinate like the other boys, and often could not void at all. He had no eneuresis as a child nor since. He has never had gleet, stricture nor great difficulty of urination. He denies syphilis and has never had symptoms of tabes. At the age of 17 he entered the Naval Academy, but after 18 months resigned on account of his eyes which subsequently got all right with the use of glasses. One day, while at Annapolis, he accidentally discovered a lateral hemiopia which has recurred at intervals since (now about 20 times in all). About two years ago he took a course of osteopathic treatment, and a tender spot was discovered between the last lumbar and first sacral vertebræ (this tenderness persists and the skin is red). In 1905 he began to have burning during urination, but this was relieved by internal medicines. He consulted his present physician in October, 1905, who writes as follows: The patient complained of difficult and unduly frequent urination. Examination discloses a flabby prostate, swollen vesicles and hypersensitive urethra, but no urethral discharge. A catheter withdrew 24 ounces of residual urine, since then catheterization has shown a residuum every day from 17 to 22 ounces. Examination by a neurologist showed no lesion of the nervous system and an opthalmological examination was also negative. When catheterized in the recumbent position the urine flows slowly without force, requiring pressure on the abdomen by use of the accessory muscles to facilitate emptying.

Status præsens.—The patient voids urine 10 or 12 times during the day, catheterizes himself at night and after that does not void until morning. There is considerable hesitation when starting the flow of urine and the stream is small and intermittent, and considerable straining is necessary to evacuate the bladder. There is constantly present a slight burning sensation in the deep urethra. The catheter finds usually from 16 to 26 ounces of residual urine. After catheterization he does not void as a rule for 12 hours. Occasionally he voids shortly after catheterization. He finds that the difficulty of starting the flow of urine is lessened by bending forward and flexing first one thigh and then the other against the abdomen ("according to the custom of dogs"). He has never had any severe pains in the abdomen.

Sexual powers are perfectly normal. He is nervous about himself, but his work as a bookkeeper is entirely satisfactory.

Examination.—The patient is a healthy looking man with lips of good color. Heart, lungs and abdomen negative.

Genitalia.—There is no urethral discharge. Testicles, epididymes and inguinal regions are negative.

Rectal.—The prostate is a little larger than normal and slightly irregular. It is distinctly but moderately indurated in places and quite tender. The seminal vesicles are not indurated nor enlarged, and there is no intervesicular induration. There are no adhesions around the prostate or vesicles and no enlarged glands. The rectum is soft and not adherent. Palpation above the prostate in the region of the bladder is negative. The prostatic secretion is composed largely of pus cells. There are a good many lecithin and large granule cells present, but no spermatozoa are

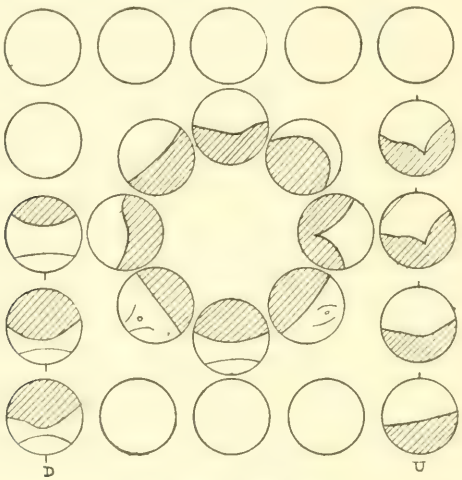


FIG. 55.—Case 137.

seen. The urine is cloudy in all three glasses, slightly alkaline, 1015, microscopically, pus cells, numerous large and short bacilli, and small, round cocci most of which are intracellular.

Cystoscopic.—A small coudé catheter meets with an impassable obstruction in the deeper portion of the prostatic urethra. A small silver catheter also fails to enter, but a very small rubber catheter is finally introduced and withdraws 440 cc. residual urine (the patient had just voided 150 cc.). The cystoscope enters with ease and shows a small, but definite enlargement of the median portion of the prostate, a round transverse median fold with a fairly deep sulcus on the left. This bar is distinctly elevated above the trigone and there is a small pouch behind it into which it is impossible to see with the cystoscope. The right lobe of the prostate is not enlarged. The left lobe presents a small globular outgrowth just at the prostatic orifice with a fairly deep sulcus between it and the median lobe, as shown in the accompanying diagram (Fig. 55).

Series U, with the beak directed upward, shows that this lobe comes prominently into view when the handle is gradually elevated. In Series D, with the beak directed downward and the handle depressed, a somewhat pointed median bar which covers most of the trigone is seen. On elevating the handle more of the trigone comes into view, but the rounded bar is very evident. The ureteral ridges are hypertrophied. The orifices look fairly normal. The bladder is considerably trabeculated, thrown into irregular folds and inflamed, and shows evidence of long standing obstruction. No diverticula are seen after a careful search, but owing to hemorrhage it is impossible to get a very good view. No calculus seen. With finger in rectum and cystoscope in urethra the beak is easily felt, and there is a slight but definite increase in the median portion of the prostate.

Remark.—The cystoscopic examination seems to furnish undoubted evidence of obstruction at the prostatic orifice.

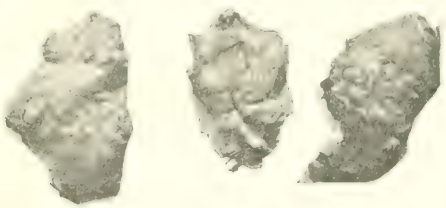


FIG. 56.—Small median and lateral lobes from man, age 37.

Operation. May 2, 1906.—Ether. Perineal prostatectomy by the usual technique. The posterior surface of the prostate was no larger than normal, smooth, regular and only slightly indurated. Bilateral capsular incisions were made a litte more distant from each other than usual. The lateral lobes, which were no larger than normal, were excised, the sharp periosteal elevator being employed. It was impossible, with the tractor, to present the median portion of the prostate into either of the lateral cavities, and the left lateral wall of the urethra had to be divided before the finger could be introduced. The prostatic orifice was surrounded by a very firm, hard ring which was difficult to break with the finger. Examination showed a very small median fold and a slight redundancy or fold of tissue along the left lateral margin. With the aid of the sharp periosteal elevator and with scissors, both of these were excised along with a portion of the mucous membrane, thus leaving a large orifice (Fig. 56, in which the fragments are placed together). The floor of the urethra and ejaculatory ducts and right lateral wall of the urethra were undisturbed. The wound was closed as usual with double tube drainage for the bladder, light packs for the lateral cavities, approximation of the levator muscles with a single suture of catgut and partial closure of the cutaneous wound with catgut. Infusion and continuous irrigation on return to the ward. Pulse at the end 88.

Convalescence.—The patient reacted well, but for three days the temperature varied between 100° and 102° and one day reached 104°. After that it was practically normal. The irrigation was discontinued after 12 hours, the tubes and gauze removed on the day after the operation. There was some bleeding and discharge of clots of blood from the perineal wound after removal of the gauze, but the patient suffered no pain and was up on the third day. On the fourth day after the operation urine began to flow through the urethra and the sutured wound appeared well healed, but on the seventh day swelling, redness and tenderness appeared at the lower end of the left branch of the V, and considerable pus was evacuated through an opening which was made in this portion of the wound. After that there was a moderate amount of suppuration for two weeks, but on the 29th day the wound looked healthy and two days later urine came entirely through the penis. Urinary control was established during the third week and before the patient left the hospital he was able to retain urine for 11 hours at night, voided freely, in a large stream, with perfect control and without pain. He was discharged from the hospital on the 33d day in excellent condition.

September 14, 1906.—The perineal fistula closed 87 days after the operation. I void urine naturally, in a good stream six times during the day and not at all during the night, as much as 650 cc. at a time and without pain. Sexual intercourse is entirely satisfactory, in fact more normal than before operation. My general health is good. I have gained 10 pounds and consider myself cured.

Pathological report.—The specimen, G. U. 283, consists of six small pieces of prostatic tissue, weighing in all about 10 gm. The left lateral lobe was removed in two pieces, the largest being 2 x 2.5 x 1.5 cm. and the smallest piece being a mere tag of tissue, they both weigh about 4 gm. The right lobe was also removed in two pieces, and weighs the same as the left. On section the prostatic tissue of the lateral lobes does not resemble at all a hypertrophy. There are no lobules seen, the surface is homogeneous, somewhat brownish in color, and on close examination is finely granular. Some small hemorrhagic points noted here and there. The consistency is firm, but elastic. The tissue resembles much that of the normal prostate. The median bar was removed in two pieces and weighs about 2 gm. Its consistency is distinctly firmer than the lateral lobes, on section the surface is rather dry, translucent, and distinct white fibrous trabeculæ interlacing in various directions through the prostatic tissue are seen.

Microscopic examination.—A section from the left lateral lobe. The acini are for the most part dilated and many of them show the serrated margin and papillary projections which are seen in the hypertrophied prostate. This condition of the acini, however, is limited to a small portion of the section. In other portions the acini are only occasionally dilated, but there is present quite an extensive prostatitis. Some of the acini are filled wih proliferating and desquamated epithelial cells and leucocytes and the infiltration extends well out into the interstitial tis-

sue, being most marked immediately surrounding the acini. Some gland groups show considerable periacinous sclerosis. The interstitial stroma is infiltrated in rather extensive areas, but at times a normal stroma is seen in between inflamed glandular groups.

A section from the deep portion of the left lateral is almost entirely composed of muscle which has probably been removed from about the vesical orifice. Within this section some areas of round cell infiltration are noted, especially around the blood vessels.

A section from the right lobe shows a picture very similar to the left lateral areas of well marked prostatitis and areas with acini similar to those of prostatic hypertrophy being found.

A section from the median bar shows a condition similar to the lateral lobes. Many of the acini are dilated, have serrated margins and papillary projections, and suggest that some glandular proliferation was in progress. In other areas, however, the acini are compressed and are involved by inflammatory processes.

CASE 138.—*Considerable enlargement of right and median lobes. Small left lateral. Nocturnal incontinence the only symptom.*

S. No. 19,071. S. McM., age 57, married, admitted April 25, 1906.

Complaint.—"Inability to hold urine."

No history of gonorrhœa.

Present illness began six months ago with dribbling of urine when in the recumbent posture. He first noticed that the bed was wet in the morning. During the day he urinated at intervals without pain and there was no dribbling, and at night he slept all the night without rising, but would invariably find the bed wet. The disease has been unchanged since the beginning. There has never been any frequency during the day, no pain, no difficulty in urination, and his general health has remained good.

Status præsens.—Incontinence at night. No increased frequency, no difficulty, no pain or hemorrhage. Sleeps all night without voiding urine and finds the bed wet in the morning. His only complaint is incontinence. His general health is good. Has had no nausea or vomiting; has not lost weight. Sexual powers normal.

Examination.—The patient is a well nourished man with lips slightly cynotic. The chest is barrel-shaped. Lungs emphysematous. The heart sounds clear but distant.

Abdomen.—A greatly distended bladder can be felt reaching half way between the umbilicus and the symphysis. There is a small complete hernia on the right side and a partially descended testicle. On the left side there is also a definite but small hernia.

Rectal.—The prostate is considerably enlarged forming a smooth lobular mass about the size of a small orange, firm but uniform in consistence. The seminal vesicles are not palpable. No enlarged glands, rectal mucosa soft.

Cystoscopic.—A catheter passes with ease and withdraws 890 cc. residual urine. The cystoscope shows a large median lobe, a moderate intra-

vesical enlargement of right lateral lobe. It was impossible to get the cystoscope into the cleft to the left of the middle lobe, owing to the height of the median enlargement. The bladder is trabeculated with numerous cellules and pouches, but no diverticula. The ureteral orifices were hidden behind median portion. No stone present. With finger in rectum and cystoscope in urethra the beak cannot be felt and the median enlargement is considerable.

Urinalysis.—Cloudy, acid, 1010, no sugar, albumin a trace, pus cells in large number.

Preliminary treatment.—Catheterization three times daily. Water in abundance, urotropin. Over 600 cc. of urine was generally withdrawn. The patient was able to void only small amounts, and about nine hours after catheterization he began to dribble.

May 7, 1906.—Operation. Ether. Perineal prostatectomy by the usual technique. The right lateral lobe was considerably enlarged and enucleated in one piece. The left lobe was about half the size of the right and firmer, but distinctly elastic. The median lobe was enucleated through one of the lateral cavities, and was considerably enlarged. A small tear was made in the mucous membrane of the urethra and a small area of mucous membrane attached to the summit of the median lobe was removed. Examination showed no further enlargement. The wound was closed as usual with double tube drainage, light packs for the lateral cavities. Infusion and continuous irrigation on return to the ward. The patient stood the operation well. Pulse at the end 100.

Convalescence.—The patient reacted well from the operation. The temperature rose to 101° on the night after the operation, but it was normal on the next and remained so until the 10th day when he had a temperature of 101.5° lasting for three days. The tubes and gauze were removed on the day after the operation and the patient was up in a chair on the second day after the operation. On the tenth day there was a slight cough and a few crackles were heard over the right lung, associated with pain and a temperature of 101.5°.

May 25, 1906.—For 10 days the urine leaked continually through the perineum. After the 10th day he had control and voided urine at intervals, at first one hour, on the 18th day three hours, and without pain.

September 13, 1906.—Letter. The perineal wound has been closed since about four weeks after the operation. Urine is voided naturally four times during the day and once at night, in normal amounts and without pain. Sexual intercourse is not entirely satisfactory, there being no emission as yet. I have gained 30 pounds and am cured.

Pathological report.—The specimen, G. U. 287, consists of three pieces representing the two laterals and the median lobe. The left lobe is a rounded mass 5 x 4 x 3 cm., the surface is lobulated, consistency firm, but elastic. On section the tissue is rather white, is not succulent, and the surface is indistinctly lobulated. The left lobe is a mass about half the size of the right, its consistency is firm, but elastic, and it is composed of numerous spheroids which seem to be largely made up of stroma. The

median lobe is a mass 4 x 2 x 2 cm. and on its upper surface is a fair-sized piece of mucous membrane. It has the same general character as both of the lateral lobes.

Microscopic examination.—The hypertrophy is a lobulated glandular one. The acini are for the most part dilated, while here and there one has undergone cystic degeneration. About the periphery of these glandular lobules the acini are compressed and elongated. Numerous areas of prostatitis are noted. The stroma contains a large amount of muscle. The arteries show no thickening.

CASE 139.—*Considerable enlargement of the lateral lobes, small median lobe. Very weak old man. Convalescence satisfactory. Left hospital in good condition. Recent case.*

No. 1285. S. C. C., age 71, married, admitted May 5, 1906.

Complaint.—" Prostatic obstruction, catheterism, pain."

The patient had gonorrhœa as a boy; no complications.

Ten years ago he had sudden complete retention of urine which was relieved by medicine. During the next eight years he remained perfectly well. Two years ago he began to have difficulty of urination and a gradual increasing frequency, and in a short time pain in the testicles. The frequency and difficulty of urination gradually increased until five weeks ago when he began the use of the catheter. Since then he has catheterized himself from one to three times daily, but has always been able to void a small amount of urine naturally. For the past year he has had a bearing down feeling in the rectum, and constipation. He has had no hematuria, except after the introduction of a catheter and has never passed a stone. He has had no pain in the back, thighs or groins, and only a moderate amount of pain in the bladder, except when the bladder becomes full and urination is difficult.

Status præsens.—Urination about every two hours, stream small, urination difficult, often accompanied by considerable straining. The patient catheterizes himself two or three times a day and does obtain some relief, but soon after catheterization has to void again. He has lost considerable weight and is very weak.

Sexual powers.—Erections and intercourse satisfactory up to one month ago.

Examination.—The patient is emaciated and a very weak looking man. The mucous membranes are pale, the lungs are hyperresonant, the breath sounds are loud and expiration is prolonged. The heart is slightly enlarged. The first sound at the apex is muffled. The pulse is regular, of good tension. There is only moderate arteriosclerosis. Abdomen negative.

Genitalia.—Varicose veins on left side, induration of right globus minor and slight hydrocele.

Rectal.—The prostate is considerably enlarged, smooth, somewhat irregular in contour, the left lobe being larger than the right, and somewhat lobulated. The consistence is generally elastic, but somewhat firm,

and on the right side near the apex there is a nodule about the size of the finger tip of stony hardness, and extending laterally from this is an indurated band running out to the pelvic wall. The membranous urethra is soft, and there is no induration in this region. The regions of the seminal vesicles are negative and there is no intervesicular mass. No enlarged glands are present. The rectal mucosa is soft and movable.

Cystoscopic.—The patient voided 30 cc. of urine. A coudé catheter passes with ease and finds 300 cc. residual urine. The bladder is somewhat contracted. The cystoscope shows a slight enlargement of the left lateral lobe, a considerable enlargement of the right lateral lobe with a small thin transverse bar in the median portion of the prostate. The bladder is trabeculated, inflamed, and external to the urethral orifice on each side a small diverticulum is seen. There is no stone present. With finger in rectum and cystoscope in urethra the beak is easily felt. There is only very slight increase in the median portion of the prostate and no subtrigonal thickening.

Urinalysis.—Cloudy, acid, 1013, albumin a trace, no sugar, no casts. Microscopically, pus cells, red blood corpuscles.

Operation, May 9, 1906.—Ether. Perineal prostatectomy by the usual technique. The left lobe was moderately hypertrophied and removed in one piece. The right lateral lobe was considerably enlarged, a globular intravesical projection being present. It was easily removed in one piece. A small median bar was delivered into the left lateral cavity and removed, the urethra being torn but none removed. Examination with the finger showed no remaining prostatic enlargement. The ejaculatory ducts were preserved intact. The wound was closed as usual with double tube drainage, light packs for the lateral cavities, approximation of the levators with a single suture of catgut and partial closure of the cutaneous wound with interrupted sutures of catgut. Infusion on the table, continuous irrigation on return to the ward. The patient stood the operation well. Pulse at the end 100.

Convalescence.—The patient reacted well. Six hours after the operation the scrotum was found distended to the size of a child's head with extravasated fluid. Examination showed that the exit tube was not draining well, the wound was sewed too tightly around the catheters and fluid escaping from the bladder had extravasated beneath the skin into the scrotum. By making pressure it was found possible to evacuate the extravasation through the perineal wound, though owing to the fear of infection it was thought best to make two small incisions for the insertion of small gauze drains.

For six days the patient had pyrexia which reached 103° on the fifth day, but after that it was normal. He was quite weak for seven or eight days, and on the fourth day he was given an infusion. Although weak he was up in a wheel-chair every day and during the second week improved rapidly. On the 22d day most of the urine was coming through the urethra. The patient was discharged on the 30th day after the operation. A minute perineal fistula was present, through which a small

amount of urine escaped. The patient had become quite strong, was entirely comfortable, voided urine without pain and insisted on going home.

September 14, 1906.—Letter. The perineal fistula healed 94 days after the operation. Urine is voided naturally at intervals of three or four hours, about a pint at a time. I have no pain, no erections. Have gained 20 pounds in weight.

Pathological report.—The specimen, G. U. 291, consists of two pieces, the left lobe and a portion which represents the vesical part removed in one piece. The mass measures 6 x 5 x 3 cm. The intravesical portion is connected with the main mass by a narrow neck of tissue. The surface is lobulated, consistency soft. On section the tissue is composed of numerous lobules, irregular in shape and of varying size. In one of the lobules the ducts are very much dilated, but the others are smooth, firm and seem to contain a large proportion of stroma. The right lobe is a somewhat rounded mass, much smaller than the left, and measures 2.5 x 2 x 2 cm. The surface is lobulated and the consistency is soft. On section it is entirely composed of spheroids of different sizes and shapes, with but little interspheroidal tissue. Numerous areas of dilated ducts are to be seen. About the lobe as a whole is a fairly well developed capsule.

Microscopic examination.—The hypertrophy is a lobulated glandular one. The acini are dilated, show numerous intraacinous papillary projections. In some acini there is capillary looping of the epithelium present. In one area the acini are very much dilated, and growing out from the periphery on all sides are slender strands of epithelium which apparently have very little supporting stroma. The epithelial projections by their union form irregular shaped spaces within the acini. The epithelium is rather pale, of a high columnar type, and there is no tendency to infiltrate in the stroma. Some areas of chronic inflammation about the blood vessels. The blood vessels seem normal. The stroma is rather loose in character and contains a moderate amount of muscle.

CASE 140.—*Moderate enlargement of median and lateral lobes of the prostate with induration of prostate and vesicles and pelvic lymph glands. Large vesical calculus. Perineal prostatectomy and lithotomy. Cure. Recent case.*

No. 1287. A. L., age 58, married, admitted May 3, 1906.

Complaint.—"Frequency of urination and pain."

There is no history of gonorrhœa.

Present illness began one and one-half years ago with burning during urination, frequency and difficulty. One month later he had hematuria. The course of the disease has been marked by the gradual increase in the frequency and difficulty and pain. He has never had complete retention of urine nor been catheterized.

Status præsens.—Urination every hour night and day, accompanied by a burning pain in the urethra and a sharp, severe pain at the end of urination radiating to the end of the penis. He has had no pain in the back, but occasionally a slight pain in the outer side of both thighs. Hematuria

has been present occasionally. He has grown weaker, but has not lost much in weight. His sexual powers are still present.

Examination.—The patient is a fairly strong looking man with lips of good color. The heart, lungs and abdomen are negative.

Genitalia.—Negative.

Rectal.—The prostate is not greatly enlarged, it is smooth, moderately indurated, but not of stony hardness. The lateral lobes are uniformly large, there are no nodules, no areas of tenderness. The right seminal vesicle is not definitely enlarged, but several hard cords are felt in this region and three or four enlarged, somewhat indurated glands are found at the outer end of the vesicle along the pelvic wall. The left seminal vesicle is also not much enlarged, but several cords and a small mass of glands are also discovered on this side. In the sacral fossa there is a small mass suggestive of glands felt.

Cystoscopic.—The patient voided about 100 cc. urine. A coudé catheter was then passed with ease and 100 cc. withdrawn. The bladder capacity is 250 cc. The cystoscope shows very little intravesical enlargement of the lateral lobes. There is a small but definite rounded median lobe with a shallow sulcus on each side. Behind this a large, smooth, oval calculus, free in the bladder, is seen. The bladder is considerably inflamed and trabeculated, but no diverticula are seen. With finger in the rectum and cystoscope in urethra, no increase in the subtrigonal tissues is made out and the median portion of the prostate is definitely, but not very greatly hypertrophied.

Urinalysis.—Cloudy, acid, 1012, no sugar, albumin in small amount. Microscopically, pus cells and a few red blood corpuscles.

Operation, May 9, 1906.—Ether. Perineal prostatectomy by the usual technique. Removal of a large vesical calculus through the perineum. The lateral lobes were moderately enlarged, and each was removed in one piece, they were quite adherent and stripped with some difficulty. A small median lobe was delivered into the right lateral cavity and enucleated, a small tear being made in the urethra which was then split open along its lateral wall. The neck of the bladder was then dilated with forceps, a stone forceps inserted and a large oval calculus easily removed, without division of the muscular fibers at the neck of the bladder. Examination with the finger showed no remaining prostatic enlargement, no calculus. The floor of the urethra and ejaculatory ducts were preserved intact. The wound was closed as usual with double tubes for the bladder, light packs for the lateral cavities, approximation of the levators with single sutures of catgut, and partial closure of the cutaneous wound with catgut. The patient stood the operation well. Infusion and continuous irrigation on return to the ward. Pulse at the end 85.

Convalescence.—The patient reacted well. The highest temperature was 100.8° on the day after the operation, after that it was normal. The gauze was removed on the day after the operation and the tubes on the next day, and the patient was then gotten out of bed. Urine came through the anterior urethra during the second week. The fistula closed on the 14th

day, and the patient was discharged on the 17th day after the operation in excellent condition, voiding urine freely without pain.

June 16, 1906.—The patient returns for examination. He voids urine naturally in a large stream and without pain at intervals of four hours during the night, but more frequently during the day. His general health is excellent.

September 12, 1906.—Letter. I void urine from 6 to 10 times during the day and 2 or 3 times at night in amounts varying from 1 to 8 ounces. Have pain in the urethra when weather changes. No erections. General health good. Am cured with exception of slight pain.

Pathological report.—The specimen, G. U. 289, consists of three pieces of tissue representing the two lateral lobes and the median bar, total weight about 11 gm. The left lobe is a somewhat rounded mass 2 x 2 x 1.5 cm. The consistency is rather firm and the urface shows no lobulation; the cut surface, however, shows several large lobules which are smooth, and show no dilated acini. The right lobe is less than half the size of the left and is somewhat irregular. Its cut surface is homogeneous, and there is no formation of spheroids. The median bar weighs about 2 gm. and measures 2.5 x 1 x .5 cm. Its consistence is firm and elastic, it shows no tendency to the formation of spheroids, but its cut surface has a rather grayish homogeneous appearance with a few dilated ducts here and there. The gross picture in this median bar strongly suggests chronic prostatitis. A smooth calculus, oblong, flat, and measuring 4 x 3 x 1.5 cm. was removed. Ejaculatory ducts not found in specimen.

Microscopic examination.—Sections from the left lateral lobe show a tissue which is largely composed of stroma, although here and there areas containing aggregations of acini are encountered. The acini within these areas are dilated and show numerous intraacinous papillary projections; some areas of chronic prostatitis are seen. The blood vessels are only slightly thickened and the stroma seems mostly composed of fibrous tissue.

In the median bar glandular areas alternate with areas in which the stroma predominates, but there is present a much more extensive prostatitis than in either of the lateral lobes. In areas this had led to considerable fibrous tissue formation.

Case 141.—*Small globular median lobe. No lateral enlargement. Complete retention of urine. Catheter life two years. Prostatectomy: Removal of small lateral and pedunculated median lobe. Persistence of obstruction. Second operation on eighth day. Excision of median portion of prostate. Rapid convalescence. Wound closed on 20th day after first operation. Recent case.*

No. 1292. H. H. L., 60, married, admitted May 14, 1906.

Complaint.—" Prostatic obstruction. Catheterism."

Gonorrhœa in youth followed by slight stricture, no gleet.

Present illness began five years ago with slight increased frequency of urination. About four months later urination suddenly became very dif-

ficult and he was catheterized, about eight ounces residual urine being withdrawn. During the next two years was catheterized once a day at bedtime, voided frequently and in driblets during the day. During the past two years retention of urine has been complete and the patient has catheterized himself about five times a day. During this time he has had very little vesical disturbance, and has been treated by Dr. Smith by prostatic massage three times a week. Under this treatment the size of the prostate has been reduced one-third in size, but retention of urine is still complete. Has had two attacks of epididymitis. The patient has had two Bottini operations, single posterior cut each time without success.

Status præsens.—The patient catheterizes himself about five times a day, using a soft rubber catheter and withdrawing from eight to eleven ounces of urine. Is never able to pass urine naturally; no hematuria, no calculus, no pain unless the bladder becomes too full. Occasionally there is a slight bloody urethral discharge associated with tenderness in the prostate. He has gained in weight. No pain in back, thighs, legs, groins, or testicles.

Sexual powers.—Patient still has erections and sexual desire, but has not had intercourse for several months.

Examination.—The patient is a sturdy looking man with lips of good color. Pulse regular, no arteriosclerosis. Lungs are normal, heart not enlarged and there are no murmurs, but the valvular sounds are slightly muffled. Abdomen is negative.

Genitalia.—Slight induration of right epididymis.

Rectal.—Prostate is very little larger than normal. It is smooth, slightly indurated, not tender. The base of each seminal vesicle is slightly indurated, particularly the left. There is no intervesicular mass. The membranous urethra is soft. There are slight indurations along the left lobe of the prostate and left vesicle. The induration of the vesicles is of moderate degree.

Prostatic secretion contains numerous actively motile spermatozoa, pus cells, large and small granular cells, very few lecithins. The urethral discharge is composed of pus and epithelial cells, no bacteria.

Cystoscopy performed August 15, 1905. The catheter encounters a stricture of large caliber four and three-quarters inches from the meatus. No. 24-F. bulbous bougie passes with ease. A coudé catheter withdraws about 300 cc. urine. Retention of urine is complete. The cystoscope shows very little enlargement of the lateral lobes and a definite, small, rounded median lobe with a sulcus on each side. A small depression in the top of this is present, probably the site of the Bottini incision. The bladder is only slightly trabeculated, no diverticula, no stone present.

Urinalysis.—1028, slightly acid, trace of albumin, no sugar, no casts seen, moderate amount of pus, much phosphates, many bacilli.

May 15, 1906. Operation.—Ether. Perineal protatectomy by the usual technique. The lateral lobes seemed little, if at all, enlarged, but were easily stripped out and were about 2 or 3 cm. in diameter. In removing

the median lobe a tear was made in the urethra and the lobe was finally drawn into the left lateral cavity through the urethra and enucleated with a portion of its mucous membrane. The tractor was then withdrawn and examination made with the finger in the urethra. There was no remaining enlargement, but the sphincter was quite evident, gripping the finger somewhat. After it had been thoroughly dilated the operator thought that it was not necessary to divide it or excise more of the median portion of the prostate. The wound was then closed with double tube and gauze drainage as usual. The patient stood the operation well, pulse at the end being 75. Infusion and continuous irrigation on return to the ward.

Convalescence.—The patient reacted well from the operation and was comfortable until the second day when the tubes were removed. He then began to have pain which came on frequently with desire to urinate. Micturition was difficult and painful. On the sixth day after the operation the spasmodic pain at intervals persisting, a silver catheter was passed and 460 cc. residual urine withdrawn. For a few hours the patient was comfortable, but after that he began to suffer frequent urination and severe pain, so that it seemed evident that the obstruction had not been completely removed. On the eighth day after the first operation the patient was etherized, the wound broken open and an examination made of the prostatic orifice. It was found surrounded by a spasmodic firm sphincter and in the median portion a small mass of mucous membrane representing the capsule of the median lobe was present. With forceps and scissors this capsule and the fibrous median portion of the sphincter was excised with scissors leaving quite a large orifice. Double drainage tubes were inserted as before, and after excision of the edges the wound was closed. The patient stood the operation well and convalesced rapidly. The tubes were removed on the day after the operation, and the patient voided without pain. On the fourth day he had control of urination. Urine passed through the anterior urethra on June 1, and the fistula closed completely on June 4, the 20th day after the first operation. The patient was discharged on June 6, the 22d day after the first operation, in excellent condition, able to retain urine for seven hours at night and four hours during the day and free from pain. He had perfect control, the wound was healed, urine was voided in a large stream, was clear, and contained no bacteria, as shown by stained centrifugalized specimen and a silver catheter passed with ease and found no residual urine.

September 14, 1906.—Letter. Urine is voided naturally, about eight or ten times during the day and none at night, five or six ounces at a time. No pain. Sexual intercourse is not entirely satisfactory in that the pleasure is not so great as before operation. I have gained in weight and am entirely cured.

Pathological report.—The specimen, G. U. 295, consists of three pieces of tissue representing the two lateral lobes and a small pedunculated median lobe, total weight about 8 gm. The lateral lobes each weigh 1½ gm. and the median lobe about 5 gm. The tissue in the right and median

lobes is lobulated, soft, and on section is succulent and composed of small spheroids. There is a small piece of mucous membrane attached to the median lobe. The left lateral is distinctly firmer than the other two lobes, the surface is not lobulated, and on section is homogeneous and contains no spheroids, it apparently contains a large amount of stroma. It seems that we have hypertrophied tissue in the right and median, while the left lobe looks like normal prostatic tissue, except that it seems to contain somewhat more stroma. The pedunculated median was evidently a growth from the subcervical group of glands.

Microscopic examination.—Sections from the left lateral show a tissue in which the stroma, excepting a few small areas, is much in excess of the glandular element. The acini in many areas are small, and about them is quite an extensive periacinous sclerosis. The inflammatory infiltration often extends well out into the interstitial tissue, and both the glandular groups and the intervening stroma are infiltrated with leucocytes and round cells in quite extensive areas. The picture is that of a chronic prostatitis in which there has been considerable fibrous tissue formation. The acini are not dilated and show none of the complexity of lumina which one sees in hypertrophied prostates.

Sections from the right lateral show areas containing somewhat more gland tissue than the left, but the stroma as a whole is considerably in excess of the gland element. There has been extensive fibrous tissue hyperplasia, both in the interstitial stroma and immediately surrounding the acini. In quite extensive areas the acini are small and compressed, and many have apparently been destroyed. About many of the acini fairly active inflammatory processes are still present.

Section from the median lobe.—Here the stroma also predominates, but there are a few well defined gland accumulations in which the acini are dilated and present serrated margins. In many areas there is a well marked periacinous sclerosis with inflammatory infiltration, extending well out into the interstitial stroma. The blood vessels show practically no thickening.

Case 142.—*Very large globular intravesical median enlargement of the prostate. Lateral lobes small. Enucleation without difficulty through perineum. Severe cystitis with exfoliation of vesical mucosa passed through perineal wound on the 27th day. Recent case.*

S. No. 19,108. O. W. S., age 72, widowed, admitted May 12, 1906.

Complaint.—"Prostatic trouble."

No history of gonorrhœa.

Present illness began about five years ago with frequency of urination which gradually increased, but was not associated with pain. About two and one-half years ago the patient began to have dribbling of urine and six months later hematuria and pain of a dull aching character in penis and rectum. He went to a hospital in another city where a catheter was used and prostatectomy advised. During the past two years his condition has gradually grown worse, and he is now voiding every half hour during

the day and night. There is a dull pain constantly present at the neck of the bladder and a very severe pain during urination. Hematuria occurs occasionally, but he has passed no stone. There is no pain in back, hips, thighs, legs, testicles or groins. He has lost 15 pounds in weight and is very weak. He is able to void only a small quantity of urine, often only a few drops at a time and has to strain to start the flow.

Sexual powers.—No note made.

Examination.—The patient is a thin, weak-looking, old man. The mucous membranes are of fair color. There are a few crackling râles at the base of the left lung. The heart is enlarged and there is a soft systolic murmur at the apex. The second pulmonic is loud and bell-like. The abdomen is negative.

Genitalia.—Negative. Double inguinal herniæ are present for which he wears a truss.

Rectal.—The prostate is considerably enlarged, smooth, elastic, about the size of a large orange. The seminal vesicles cannot be reached and the rectum is negative. There are no enlarged glands present.

Cystoscopic.—The patient is unable to void (has been catheterized before, the residual urine is usually large). The bladder capacity is large. The cystoscope shows a very large, globular median lobe which fills the base of the bladder. It is impossible to see the ureters. The lateral lobes are only slightly intravesically enlarged, and there is no cleft between them in front. The mucous membrane is everywhere normal in appearance with the exception of a slight acute inflammation. The bladder is considerably trabeculated; no stone or diverticula present. With finger in rectum and cystoscope in urethra it is impossible to feel the beak, owing to a very large mass in region of median portion of prostate and trigone.

Urinalysis.—(Unfortunately lost).

Preliminary treatment.—Catheterization two or three times daily, water in abundance, urotropin.

Operation, May 18, 1906.—Ether. Perineal prostatectomy by the usual technique. The left lateral lobe was moderately enlarged and removed in one piece. The right lateral lobe was considerably enlarged and also enucleated in one piece. The median lobe was very large and could not be engaged with the double bladed tractor. The finger was then inserted into the bladder and could with difficulty be hooked around a tremendous pedunculated intravesical lobe which covered the entire base of the bladder. With the old single-bladed tractor the prostate was drawn down and easily enucleated mostly through the left lateral cavity (Fig. 57), a small portion being removed through the right side. The urethra mucosa was torn, but none was removed, but a portion of the mucous membrane covering the summit of the huge median lobe came away with it. The wound was closed as usual with double tube drainage, light packs for the lateral cavities. The patient was infused on the table, there was more hemorrhage than usual, but his condition at the end of the operation was good, pulse 80. Continuous irrigation on return to the ward. Pulse at end 100.

Convalescence.—About one hour after the operation the pulse became quite weak, but it was only 120 to the minute, and in a few minutes fell to 100. After that the pulse remained good. The temperature has never risen above 99.5°, and has generally been normal. The tubes and gauze were removed on the second day after the operation, and the patient was out of bed on the fourth day. On the eighth day the wound became infected and broke down. For a time after that the surface of the wound



FIG. 57.—Large globular median lobe, moderate sized lateral lobes, exact size.

was covered with a dirty exudate and the wound was very foul. He was treated vigorously by antiseptic irrigations and applications of nitrate of silver to the wound, and on June 6 his condition had improved considerably, but he was apathetic and complained of some pain in the bladder. On June 14 the patient suddenly began to void urine through the penis, and complained of pain in the perineum. Examination showed what seemed to be a slough in the wound. A urethral irrigation was given, and following this the patient had a spasmodic attempt at urination, and suddenly a large mass was forced out of the perineal wound. Examination

of this showed that it was a large, membrane-like mass and evidently an exfoliated vesical mucosa. Following this the patient felt distinctly more comfortable, but it is remarkable to note that he had not suffered greatly. The urine was very purulent, and it is evident that the bacterial infection of the bladder has been very severe and produced exfoliative cystitis.

June 15, 1906.—The condition of the patient is good. The perineal wound looks much healthier, but no urine as yet escapes through the urethra.

September 15, 1906.—Letter. The perineal wound closed about five weeks after the operation and has remained healed. I void urine naturally at intervals of from one to three hours. Suffer no pain, do not have erections. My general health is good and I have gained in weight. I consider myself cured.

Pathological report.—The specimen, G. U. 297, consists of five pieces, weighing in all 70 gm. (Fig. 57). The median portion was removed in two pieces and weighs 43 gm. The median lobe is formed of a large, rounded mass which is covered with mucous membrane and separated from two lateral wings by deep clefts. The right lateral weighs 17 gm., and the upper portion consists of a large, smooth spheroid, measuring 2 cm. in diameter, the remainder of the lobe is composed of small spheroids. The lateral lobe is a lobulated mass weighing 10 gm. All three lobes are firm and elastic in consistency and on section are rather suculent. They are composed of spheroidal masses, some of which can be enucleated.

Case 143.—*Very slight hypertrophy of median and lateral lobes of prostate. Diverticulum of left half of bladder containing ureteral orifice. Recent case.*

No. 1261. G. W. B., age 53, married, admitted April 10, 1906.

Complaint.—"Prostatic trouble."

The patient had gonorrhœa about 30 years ago, complicated by swelling of the testicles and later with evidence of stricture for which he was treated by passage of sounds. No gleet afterward.

Present illness began 18 months ago with slight difficulty and pain on urination. There was marked frequency during the day, but none at night. In November, 1904, the symptoms continuing, he consulted a physician who told him that he was suffering from enlarged prostate with two or three ounces of residual urine, and cystitis, and he was treated by internal medicines and bladder irrigations without a catheter. After two months' treatment, the patient felt so much worse that he discontinued treatment. In August he consulted a specialist in New York who said that his prostatic trouble was not sufficient for operation.

Six months ago his condition was as follows: At times considerable frequency of urination and slight difficulty and burning pain during micturition. At others, if particularly occupied, three or four hours might intervene between urinations. He then consulted a physician who treated him by posterior injections and prostatic massage with little benefit. The patient has had no treatment since, and his condition has remained the

same. He has never passed a calculus, nor had hematuria. Has not had pain in back, hips, thighs, testicles, groin or rectum. His general health has remained good, and he has not lost weight.

Sexual powers.—There is a tendency to precocious ejaculations, but erections and intercourse are entirely satisfactory.

Status præsens.—Micturition six times during the day. Occasional attacks of considerable frequency during the day, but none at night. The stream is always slow, urination somewhat difficult, and there is always a burning sensation in the urethra. No severe pain, no blood. General health is excellent.

Examination.—The patient is a healthy-looking man with lips of good color. No arteriosclerosis, pulse good.

Genitalia.—No urethral discharge. Right testicle smaller than the left. Right epididymis indurated and several large nodules at upper end.

Rectal.—Prostate is a little larger than normal, but slightly indurated. Moderate induration at the base of each seminal vesicle, but the upper portions of both vesicles are soft. There are adhesions along the outside of the right vesicle, and the upper end of the prostate of slight degree, none along the left. The prostate gives way on massage, the induration being of slight degree.

The prostatic secretion contains a great number of pus cells, lecithins, epithelial cells, large and small granular cells, no spermatozoa.

Cystoscopic.—A coudé catheter passes with ease and finds 65 cc. residual urine; bladder capacity 370 cc. Considerable washing is required to cleanse the bladder. The cystoscope shows a small, round median bar which is continuous with the lateral lobes without intervening sulci. The lateral lobes are very little intravesically enlarged, and the sulci between them in front is very shallow. The bladder is considerably trabeculated and inflamed. The trigone is hypertrophied. The right ureter is normally located, and outside of it are several prominent septa with several deep pouchs between. In the region of the left ureter is a large orifice of a diverticulum. The ureteral ridge is very prominent on the inner side of this orifice, but the ureteral orifice cannot be seen, evidently having been drawn into the diverticulum. It is impossible to introduce the cystoscope into the diverticulum for visual examination of its interior, but its cavity was very dark, and it is evidently of fairly large size. There is no stone present. With finger in rectum and cystoscope in urethra the beak is easily felt, there is only moderate increase in thickness of the median portion of the prostate.

Urinalysis.—Acid, small amount of albumin, no sugar, no casts seen, some pus, large bacilli.

May 15, 1906. Operation.—Ether. Perineal prostatectomy by the usual technique. The lateral lobes were very little, if at all, enlarged, and were easily removed in one piece. In attempting to remove the median portion through the left lateral cavity a tear was made in the left lateral wall of the urethra. A small, slightly rounded lobe was then removed through the left lateral cavity in two pieces. Examination with the finger after

removal of the tractor showed a fibrous condition still remaining beneath the base of the median lobe and this was caught with forceps and excised, leaving a large opening at the vesical neck. Examination with the finger showed no remaining enlargement. The wound was closed as usual with double tube drainage, light packs for the lateral cavities. The patient stood the operation well, pulse at the end 84. Infusion and continuous irrigation on return to the ward.

Convalescence.—The patient reacted well and the highest temperature was 100.6° on the second day after the operation, after that being practically normal. The gauze was removed on the day after the operation and the tubes on the next day. The patient was out of bed on the third day. The perineal fistula closed on the 12th, and he was discharged from the hospital on the 16th day in excellent condition with perfect control and voiding urine at intervals of eight hours at night and four hours during the day.

June 11, 1906.—The condition of the patient is excellent. He is free from pain, the wound is closed, urine is voided normally at long intervals. He feels immensely relieved.

September 18, 1906.—Letter. Void urine naturally, four or five times during the day and sometimes none at night, occasionally as much as 18 ounces at a time. No pain. Erections somewhat imperfect and intercourse unsatisfactory. General health good. Urine contains no pus and no albumin. Entirely cured.

Pathological report.—The specimen, G. U. 294, consists of six pieces of tissue, a right and a left lateral lobe, each weighing about 3 gm., two small pieces constituting the median bar and weighing about half a gram, a small suburethral piece of tissue which weighs half a gram, and a portion of tissue removed from beneath the capsule weighing 1 gm. The total weight is 8 gm. The tissue is firm and elastic, the surface is not lobulated. On section it resembles somewhat normal prostatic tissue, except it is whiter and apparently contains more stroma. In one of the lateral lobes a small nodule about the size of a pin-head, which resembles much a beginning spheroid, is seen, otherwise the tissue is homogeneous. The tissue of the median bar seems quite fibrous. The suburethral nodule seems to contain gland tissue and resembles a small encapsulated spheroid.

Microscopic examination.—Sections from the lateral lobes show tissue in which the glandular elements are far exceeded by the stroma. The acini are for the most part small, and there has been an extensive periacinous sclerosis, at times in extensive areas nothing but vestiges of acini remain. Here and there one encounters small areas where a fair number of somewhat dilated acini are grouped together and they are filled with proliferating and desquamated cells, but apparently no leucocytes. The stroma contains a large amount of tissue and there is a moderate degree of arteriosclerosis present. Quite numerous corpora amylacea are seen in the ducts.

Sections from the suburethral tissue show it to be more glandular, although the acini are separated from each other by rather broad bands of

stroma except in a few small areas where the culs-de-sac are dilated and show numerous papillary projections and are separated from each other by narrow bands of stroma. A well-marked prostatitis is present in areas and in these portions there has been some fibrous tissue formation.

A section of tissue removed beneath the vesical orifice is entirely composed of connective tissue and muscle bundles. About many of the blood vessels there is some round cell infiltration with a formation of considerable fibrous tissue.

Case 144.—*Slight enlargement of median and lateral lobes. Three vesical calculi. Perineal prostatectomy and lithotomy. Cured. Recent case.*

No. 1229. J. D. Y., age 61, married, admitted May 21, 1906.

Complaint.—" Frequency of urination and pain."

Gonorrhœa once as a boy, no complications or sequellæ.

Present illness began one and one-half years ago with a sudden attack of great frequency, difficulty and pain in voiding urine. He was treated by internal medicines and after two days felt perfectly well, but in a short time a similar attack appeared again, and since then with increasing frequency. He has not had complete retention of urine, but last summer was treated by frequent catheterization without benefit. At that time only about one ounce of residual urine was found. The course of the disease has been characterized by gradually increasing difficulty and frequency of urination, and pain radiating to the end of the penis and worse at the end of urination. There has also been a dull pain in the rectum and neck of bladder when walking. He has not had hematuria and there has been no loss of weight.

Status præsens.—Urination every two hours during the day and every one and one-half hours at night. Urination is free, but there is pain at the end of urination, he also has pain in walking and riding in a carriage, no pains elsewhere, no hematuria. General health is fair.

Sexual powers.—No erections and no desire for coitus for one and one-half years.

Examination.—The patient is quite a fat subject, and his color is bad, but the chest and abdomen are negative with the exception that the latter is large and pendulous.

Rectal.—The prostate is slightly enlarged, symmetrical, smooth, firm, elastic. The seminal vesicles are negative, no nodules, no glands.

Cystoscopic.—A small coudé catheter passes with ease and finds 50 cc. residual urine. The bladder capacity on forced distention is 210 cc. The cystoscope shows three moderately large, irregular, dark stones in the bladder. The lateral lobes of the prostate are not enlarged, and there is only a slight median bar. Examination was not very satisfactory on account of hemorrhage. With finger in rectum and cystoscope in the urethra there is a fairly considerable increase in the median portion of the prostate.

Urinalysis.—Cloudy, no sugar, albumin a trace, microscopically, numerous pus cells and cocci.

Operation, May 22, 1906.—Ether. Perineal prostatectomy by the usual technique. Extraction of three calculi from the bladder through the perineum. The perineum was extremely fat and the prostate situated very deep. It was exposed, however, with no great difficulty and two slightly enlarged lateral lobes removed each in one piece. A small median lobe about 1½ cm. in diameter and a small median bar were removed attached to the left lateral lobe. Examination with the finger showed no remaining enlargement, and up to this point the urethra had not been injured. In order to make room for the extraction of the stones the urethra was then divided along the left lateral wall as far as the vesical orifice, the neck of the bladder dilated with forceps, the stone forceps introduced and the three calculi removed together at one time. Careful examination showed no other calculi and no fragments. Examination of the prostatic orifice with the finger showed no remaining enlargement. The wound was closed as usual with double tube drainage for the bladder and light packs for the lateral cavities. The patient stood the operation well. Infusion and continuous irrigation on return to the ward. Pulse at the end 92.

Convalescence.—The patient reacted well. The highest temperature was 102.2° on the third day after the operation, but after the fifth day was normal. The tubes and gauze were removed on the day after the operation and the patient was out of bed on the next day. On the third day urinary control was established, on the fifth urine began to flow through the anterior urethra, and on the sixth day the fistula closed finally. During the second week the patient suffered from vesical and urethral irritability, but after urotropin was discontinued this disappeared. The patient was discharged on the 21st day, voiding urine freely, in a large stream, with perfect control, at intervals of four hours and without pain.

June 12, 1906.—The patient is in excellent condition, is entirely comfortable, and the urine is only slightly cloudy, but still contains a few cocci. Is instructed to continue urotropin.

September 12, 1906.—Letter. Urine is voided naturally about three times during the day and three times at night, six ounces at a time. No pain, no erections. General health good. Am cured.

Pathological report.—The specimen, G. U. 298, consists of two pieces of prostate tissue weighing in all about 20 gm. The right lobe weighs about 8 gm. It is a somewhat oval mass, surface is lobulated, consistency firm, but elastic, and on section is fairly succulent and composed of numerous spheroids. The left lobe and median have been removed in one piece and together weigh about 12 gm. The median lobe is a pedunculated lobule, rounded, and measures about 1.5 cm. in diameter. The consistency of the mass as a whole is very soft, and on section it is made up of lobules of varying sizes. No ejaculatory ducts. Three calculi have been removed, the largest is 3 cm. in diameter and 1 cm. thick, the other are each 2 cm. in diameter and 1 cm. thick.

Case 145.—*Slight median bar. Three previous operations: Suprapubic lithotomy, castration, Bottini. Return of obstruction, residual urine, and frequency. Perineal prostatectomy. Excision of median portion of prostate. Cured. Recent case.*

No. 1169. J. K. T., 65, married, admitted May 22, 1906.

Complaint.—"Burning in the posterior urethra; frequency of urination and occasionally considerable difficulty."

No note as to gonorrhœa.

Present illness began about 12 years ago with frequency of urination. He soon began to suffer pain and a calculus was detected in the bladder and removed through the suprapubic region. Later the obstruction to urination grew worse and double castration was performed. This was followed by slight improvement, but the patient continued to void urine with difficulty and frequency, and he presented himself in 1902, complaining of a severe burning in the posterior urethra and urination two or three times at night. There was also a considerable hesitation and inability to empty the bladder at once. On examination the prostate was smaller than normal, very firm but not nodular. The seminal vesicles and vasa deferentia were not palpable. He was given diuretics with no benefit.

Cystoscopic examination was performed. A rubber catheter met with obstruction in the prostatic urethra, but finally entered and withdrew 135 cc. residual urine. The bladder was irritable and contracted. The cystoscope showed a definite median bar which was continuous with very slight enlargement of the left lateral lobe, there were no sulci present, the prostatic margin being more in the shape of a constricting ring. There was a definite pouch behind the median bar, the ureteral ridges and interureteral ridges were quite prominent. Both ureteral orifices were seen and secreting normal urine. Back of the left ureter was the orifice of a small diverticulum. The bladder was considerably trabeculated with numerous pouches. With cystoscope in urethra and finger in rectum the beak was easily palpable, there was a slight increase in the median portion of the prostate.

April 5, 1902. Operation.—Local cocaine anesthesia. Bottini operation, three cuts with blade No. 1, each cut 1.7 cm. in length, duration two minutes. The patient stood the operation well, there was very little hemorrhage and pain. He began to void urine an hour later and did not require catheterization. Two days later he voided urine at the intervals of two hours without pain and left the hospital in about a week.

Result.—The patient was wonderfully improved by the Bottini operation. For a long time he was relieved of all hesitation and difficulty of urination, and voided at much longer intervals. After two years he began to suffer with irritation in the bladder and posterior urethra, and a slight hesitation in urination; this gradually increased, and during the past year the patient has been very uncomfortable. He complains of severe burning in the posterior urethra, hesitation and difficulty in starting the flow of urine, a small stream and frequency of urination, particularly at night.

If he is busily occupied he is able to retain urine for four hours and can then void freely, but as a rule he voids at intervals of two hours and with difficulty. He has no pain elsewhere and no hematuria.

Examination.—The patient looks well, lips of good color.

Genitalia.—The testicles are absent.

Rectal.—The prostate is apparently no larger than normal, smooth, firm, no nodules, no tenderness. The seminal vesicles are not distinctly palpable and there are no enlarged glands.

Cystoscopic.—The patient voided 210 cc. A catheter was then passed and withdrew 50 cc. residual urine. The bladder capacity on forced distention is 300 cc. The cystoscope enters, but is firmly grasped in the posterior urethra. Study of the prostatic orifice shows a small but definite median lobe which lies to the right of the cystoscope. The lateral lobes are somewhat irregular, but only slightly enlarged. The posterior and left lateral Bottini cuts are apparently visible as shallow depressions. In Series U, with the beak looking upward and the handle depressed, No. 1, the median lobe is not seen. On elevating the handle the median lobe comes prominently into view. The bladder is much inflamed, moderately trabeculated. The left ureter cannot be seen. On deep inspiration a moderate amount of mucus is seen to rush out of the orifice and is then drawn in on expiration. On the right lateral wall of the bladder about 2 cm. distant is the small orifice of a second diverticulum. There are no other diverticula present and no stone.

Urine.—Urine is quite cloudy, acid, and contains microscopically pus cells in moderate amount. A record of the urinations shows intervals of one and one-half to four hours during the day and amounts from three to seven ounces. During the night he voided every two hours in amounts from two to three and one-half ounces, the total quantity in 24 hours being 48 ounces.

May 24, 1906. Operation. Perineal prostatectomy by the usual technique, with the exception that the suburethral method was employed, the patient having been castrated. The posterior surface of the prostate was smaller than normal, and the lateral lobes, when removed, were very small masses of tissue weighing about one gram apiece. The median portion of the prostate was excised along with the floor of the urethra. It was quite fibrous and evidently producing obstruction. Examination showed no remaining enlargement. The reasons for excising the floor of the urethra were: the greater facility with which the median bar could be removed in this way, the fact that the patient had suffered from irritation in the prostatic urethra which we wished to eradicate, and because the patient had been castrated so that epididymitis was no longer feared. Examination of the prostatic orifice after the removal of the median portion showed a dilated orifice, but no more than has been seen in many cases. The wound was closed, as usual, with double tube and gauze drainage. The patient stood the operation well. Infusion and continuous irrigation on return to the ward.

Convalescence.—The patient reacted well. The temperature arose to

101° after the operation, but after the second day was normal. The gauze and tubes were removed on the day after the operation, and the patient was out of bed the next day. The perineal fistula healed finally on the 12th day, and the patient was discharged on the 16th day after the operation, able to retain urine for four or five hours, voiding without pain and in a large stream and with no incontinence. Three days later he reported that he had slight incontinence.

September 20, 1906.—The incontinence which was present for a while after operation gradually diminished until August 15th, since which time he has had perfect control. Urine is voided naturally about six times in 24 hours, four and a half ounces being the largest amount. There is no pain. Erections have been absent for years. He considers himself entirely cured, but there is evidently a slight contracture of the bladder, as only 220 cc. of fluid can be forced in.

Pathological report.—The specimen, G. U. 299, consists of three pieces of tissue weighing in all 4½ gm. The right lobe is a small, fibrous-looking mass weighing 1½ gm. No lobulations. The left lobe weighs ½ gm., it is firm in consistency and is apparently mostly fibrous. The median portion weighs 2½ gm., and there is a small piece of the posterior surface of the prostatic urethra attached, also a slight piece of the mucous membrane of the bladder on the upper surface of the small rounded median mass. On the posterior surface portions of the ejaculatory ducts are included in the specimen. The tissue is firm in consistency, and on section has none of the typical appearance of prostatic hypertrophy. There is no spheroidal tumor formation, but the tissue appears to be largely fibrous.

RECTO-URETHRAL FISTULÆ.

DESCRIPTION OF NEW PROCEDURES FOR THEIR PREVENTION AND CURE.

By HUGH H. YOUNG, M. D.

There have been seven cases of recto-urethral fistulæ following operation in 163 cases of perineal prostatectomy. These cases have been reported in detail in another portion of this volume.

They are briefly as follows:

CASE I.—No. 9. J. M. L., age 63, admitted March 11, 1903. Perineal prostatectomy March 19, 1903. No especial difficulty in separating rectum and perineum. Besides the packing in the lateral cavities a third strip of gauze was placed between the prostate and the rectum. The perineal muscles were approximated with three buried catgut sutures, but the levator muscles were not carefully drawn together over the rectum. On the night following the operation an assistant thinking the hemorrhage was too profuse forcibly packed considerable additional gauze in the depths of the wound. The packing was removed on the sixth day, on the ninth day gas escaped and on the 14th day feces. Suprapubic drainage (a suprapubic fistula was present), was maintained for several weeks, and the perineal urinary fistula closed. Later a recto-urethral fistula formed. A second operation was performed October 2, 1903. The scar tissue excised, the rectal and urethral fistulæ closed separately, drainage of bladder through bulbar urethrotomy wound. The rectal wound broke down on the seventh day, but the urethral wound healed. The rectal fistula closed finally on the 14th day, and the bulbous fistula on the 21st day. The patient has remained well since.

CASE II.—No. 24. O. S., age 62, admitted May 2, 1902. Emaciated old man, very weak condition. Perineal prostatectomy December 19, 1903. Levator muscles not drawn together. Rectal fistula discovered on removal of gauze on the third day.

January 6, 1904.—Perineal rectal fistula laid open by division of anal sphincter and mucous membrane, retained catheter in penis. Recto-urethral fistula did not heal.

March 4, 1904.—Repair of rectum, closure of urethral fistula, drainage through bulbous urethrotomy wound. Both rectum and urethra broke down.

June 22, 1904.—Closure of rectal fistula, excision of scar tissue around urethral fistula, rubber tube drainage through urethral fistula which was not closed. Result, rectum broke down.

October 6, 1904.—Suprapubic cystostomy for drainage, closure of rectal and urethral fistulæ separately through perineum, fine silk used. Rectal wound healed per primam, and did not break down later.

Case III.—No. 26. R. K., age 61, admitted December 30, 1903. Patient in good condition. Perineal prostatectomy January 16, 1904. Levator muscles not drawn together. Following the operation constipation and abdominal pain, treated for four days by enemata of 400 cc. salt solution three times a day, a large rectal tube being used each time (given without knowledge of operator for some inexplicable reason). Removal of gauze on the fourth day, escape of feces through perineum on the sixth day.

January 26 1904.—Rectal sphincter stretched under ether. Recto-urethral fistula persisted.

February 20, 1904.—Separate closure of rectal and urethral fistula with catgut, drainage through bulbous urethra with rubber catheter. Result, both rectal and urethral wounds broke down. Both fistulæ finally contracted to a pin point size.

May 17, 1906.—Urination three or four times a day and twice at night, about a pint at a time. Perineal fistula minute, only a few drops of urine escape through it. The patient considers himself cured.

Case IV.—No. 28. H. S., age 75. Weak emaciated old man. Perineal prostatectomy February 1, 1904. Prostate small, hard, and adherent to rectum. Levator muscles not drawn together. Gauze pack between prostate and rectum. Gas passed through the wound on the day after the operation and fecal matter after removal of gauze on the third day.

November 10, 1904.—Suprapubic cystostomy for drainage, separate closure of rectal and urethral fistulæ through perineum, fine silk used. Both wounds rectal and urethral healed per primam, suprapubic drainage for three weeks, after that rapid closure of suprapubic wound, restoration of normal urination.

May 11, 1906.—Urination normal, all wounds healed.

Case V.—No. 34. J. K., age 65. Seen in Rochester, New York, March 11, 1904. Patient in good condition, sugar in urine in moderate amount (operator away from home could not wait for preliminary antidiabetic diet). Perineal prostatectomy March 11, 1904. Levator muscles not drawn together. Discovery of rectal fistula on fourth day, when the gauze was removed.

April 7, 1904.—Urethrotomy in bulbous region, insertion of catheter for drainage.

Result.—Rectal and urethral fistulæ persist.

October 18, 1904.—After preliminary diabetic diet for two weeks, during which the sugar fell from 2% to zero, the combined operation was performed. Suprapubic cystostomy for drainage, separate closure of rectal and urethral fistulæ through perineum. Slight breakdown of both rectal and urethral wounds, but complete closure after the ninth day. Suprapubic drainage maintained for 38 days. All wounds remained healed.

May 10, 1906.—Urination normal, all wounds healed.

Case VI. No. 39. S. M. G., age 62, admitted May 21, 1904. Patient in good condition. Perineal prostatectomy May 31, 1904. Levator ani muscles not drawn together. Enema on the second day followed by severe pain in the wound. Removal of gauze on the third day, escape of feces through perineum on the fourth day.

July 2, 1904.—Closure of rectal fistula. Drainage of bladder through bulbar urethrotomy, the urethral fistula could not be closed. Breakdown of the rectal wound on the seventh day.

February 6, 1905.—Closure of rectal fistula, urethral fistula not closed. Drainage through catheter in penile urethra. Rectal wound did not break down. Final closure of perineal urinary fistula.

May 19, 1906.—Urination at intervals of four hours. Rectal and urethral fistulæ have remained closed. Condition excellent.

Case VII.—No. 42. J. J. P., age 63, admitted July 14, 1904. Patient in good condition. Perineal prostatectomy July 15, 1904. Levator muscles drawn together. Unsatisfactory result, gradual increasing residual urine.

July 17, 1905.—Second perineal prostatectomy. The prostate was very difficult to expose owing to considerable cicatricial tissue between rectum and prostate, and a small tear was made into the rectum while endeavoring to push it back with the finger. The opening was closed with three layers of silk sutures. A small median prostatic bar was then removed. Rectal wound broke down on the 22d day, but gradually diminished in size.

April 21, 1906.—The perineal fistula is closed, but a very small recto-urethral fistula persists. Frequently no urine passes into the rectum, but occasionally a small amount does. Urination normal at intervals of six hours, no feces through penis. Combined operation advised, but patient is so comfortable that he does not wish anything done.

A review of these cases brings out several interesting facts.

If we exclude Case I, in which the rectal breakdown was probably due to an unnecessary stuffing of the wound with gauze several hours after operation, and the last case in which an operative tear was made into the rectum while dissecting through scar tissue of a previous operation all of the cases occurred within a period of five months, January to May, 1904. During this time the operator did not draw the levator ani muscles together with a single suture of catgut as is now done, and in several instances placed a third strip of gauze between the posterior capsule of the prostate and rectum. In two of these cases enemata were given, (in one several times) and were followed by pain in the wound and rectal breakdown on the fourth day in both cases. In one case diabetes was present and the rectum broke down on the fourth day. In

the other two cases the patients were extremely weak, emaciated men and the rectum broke down on the second and third days respectively. In the early operations the operator was careful to draw the perineal muscles together with catgut suture before closure of the wound, and during a period of thirteen months did not have a case of recto-urethral fistulæ (barring the first case, as mentioned above). After that the operator lost sight of the advisability of drawing the levators in front of the rectum, and five fistulæ occurred in a period of five months. Since then he has been careful to approximate the levator muscles in front of the rectum with a single suture of catgut, and as a result there has not been a single case of recto-urethral fistulæ since (barring Case VII), a period of two years. It seems entirely safe to assume that these recto-urethral fistulæ resulted from break down of the rectum as a result of absence of the support and protection normally afforded by the levator ani muscles. It is only necessary after exposing the posterior surface of the prostate to examine the anterior wall of the rectum with a finger in the rectum to demonstrate how very thin the rectal tissue is in this location. The sphincter ani is lower down and at the point mentioned there is very little muscle around the rectal submucosa. It is therefore only natural that these cases in which the normal support was not restored, in which sometimes gauze was packed against the thin bowel wall, or the rectum was subjected to strain (if not traumatism) by enemata given with rectal tubes, should break down after the operation. As remarked above during the past two years there has not been a single case of rectal fistulæ in a consecutive series of 118 cases. During this time the following technique has been followed: After completion of the enucleation of the prostatic lobes the double catheter drainage is inserted through the membranous urethra into the bladder. A small strip of gauze is packed within each lateral cavity of the prostatic capsule. A retractor is then inserted so as to hold the gauze and tubes out of the way anteriorly, the operator inserts a gloved finger into the rectum and palpates the bowel wall between the two fingers. Should any tear be discovered it could be readily closed with several layers of fine silk sutures. The finger is then withdrawn and a single narrow-bladed retractor is placed in the median line posteriorly and when traction is made the levator muscles are put on tension and stand out prominently on each side of the wound as shown in Fig. 1. A single suture of heavy catgut is then placed so as to include the levator

muscles near the rectum, and when tightened draws these muscles together in front of the rectum thus completely covering it, and furnishing support against the straining at stool or pressure by gauze after the operation.

Another important point is the early removal of gauze and tube drainage thus preventing a break down of the levator suture and

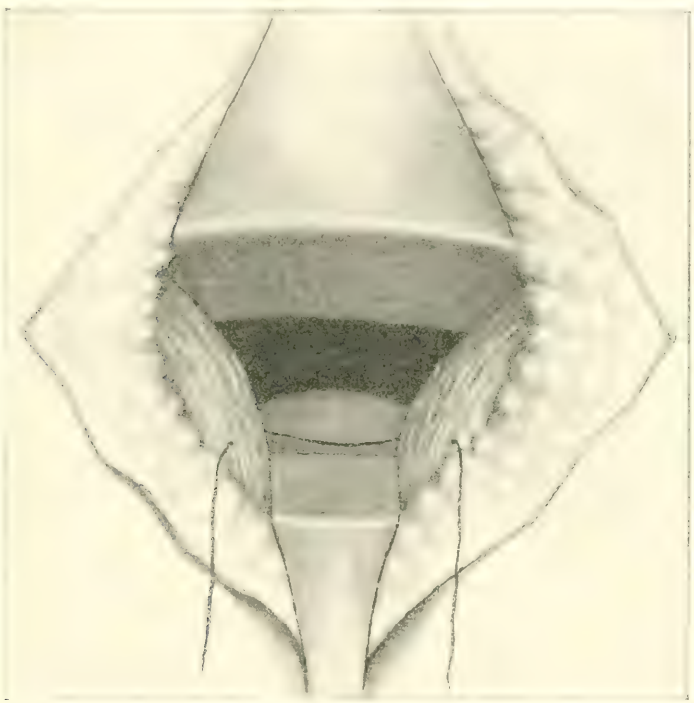


Fig. 1.

pressure against the rectum. Following these precautions the operator feels justified in saying that recto-urethral fistulæ ought rarely or never to occur after perineal prostatectomy.

The treatment of recto-urethral fistulæ.—This has for many years been a bête noire of perineal operations and it is only necessary to see the number of procedures which have been advised to realize how ineffectual all efforts have been. Surgeons have even gone so far as to establish colostomy in order to do away with this distressing condition.

The technique usually employed consists in excising the cicatrix surrounding the fistulæ and closing the rectal and urethral openings separately, with or without drainage of the bladder through a retained catheter. In five of the cases mentioned above this procedure was adopted and the rectum broke down and a fistula persisted in all but one case, in which it finally healed. In every one of these cases except one, the urethral wound also broke down, and this is the one in which the rectal fistula finally closed without further operation. It is therefore evident that the urethral fistula and the constant passage of infected urine through the urethra, together with the spasmodic contraction of prostatic, rectal and perineal structures which occurs during urination are important factors in the breakdown of the rectal sutures.

After trying various methods as detailed in the cases above (simple dilatation of the rectum, division of anal sphincter and laying bare the perineal rectal fistulæ, closure of rectal fistulæ alone, simultaneous closure of both rectal and urethral fistulæ, with drainage through a catheter in penile urethra, through a bulbous urethrotomy or through the urethral fistulæ itself), I became convinced that it was necessary to remove the necessity for urination through the urethra or of drainage through the urethra in order to prevent breakdown of the rectal wound. I therefore decided to supply suprapubic drainage so that all urine might escape through the suprapubic region and the spasmodic efforts of urination be done away with, followed by simultaneous closure of both rectal and urethral fistulæ through the perineum. This operation has been carried out in three cases with a perfect closure of the rectum in each case, and in these same cases there was always a breakdown of the rectal wound when the suprapubic drainage was not provided. *It therefore seems evident that the best operation for recto-urethral fistulæ is: preliminary suprapubic cystostomy, followed by closure of the rectal and urethral fistulæ through the perineum.*

The operation is best done in the following manner: The patient is placed in the Trendelenberg position, the bladder filled with fluid through a silver catheter. An incision 1½ inches long is made in the skin, the recti muscles separated, and the anterior surface of the bladder exposed after pushing back the perineum. Two silk sutures are inserted into the bladder wall not too close to the prostato-vesical juncture and the bladder incised, a long drainage tube about the size of the little finger is then inserted and the bladder closed tightly

around it with catgut. The tube should not project more than 2 cm. into the bladder so that its end does not impinge against the prostatic orifice or trigone (the opening high up on the bladder wall having been made so for the same reason). A small gauze wick is placed in the prevesical space and the recti muscles and skin are partially approximated with interrupted sutures of silver. The patient is then placed in the lithotomy position, and probe inserted through the fistulæ into the rectum and one also into the bladder (if possible). A sound is inserted in the urethra. Incisions are then made in the perineum along the line of the operative cicatrix, the scar tissue around the fistulæ excised carefully as far as the urethra and rectum. The edges of the two fistulæ are then excised until healthy tissue is obtained.

The rectum is closed first with interrupted sutures of fine silk, the first layer through the submucosa and turning in the mucous membrane, but not including it. The second layer includes the musculosa and is also of silk, the third layer is of catgut and includes additional musculosa and perirectal muscle so as to cover in the previous sutures with a thick pad of muscle. Attention is then directed to the urethral fistula which is closed with one or two layers of interrupted catgut or very fine silk sutures (the rectal wound is the most important. There is usually less tissue to approximate around the urethra). Before closing the skin a light pack of gauze is placed in the rectal and urethral wounds and the levator muscles drawn well together over the rectum with two or three sutures of catgut. The skin is partially closed with interrupted catgut, the gauze wick emerging from the anterior angle. Before leaving the table the bladder is washed free of blood by a to and fro irrigation through the suprapubic tube. After return to the bed the suprapubic tube is placed in a bottle on the floor with the end immersed in water so that siphonage will be secured (this does away with the necessity of a Cathcart apparatus).

The bowels should be kept quiet for at least six days. If they have been thoroughly emptied two days before operation, and the patient has been on milk diet for three days, little difficulty is experienced in preventing defalcation for a week. It is best to give a lead and opium pill for two or three days and to confine the patient to liquid diet. At the end of six days the bowels are moved with as little straining as possible. This is best accomplished by injecting a small amount of oil and glycerine into the rectum to be retained, and giving the patient

an ounce of castor oil by mouth followed two hours later by Rochelle salts. In this way successful evacuation of the bowels is accomplished with little straining and without the necessity of large enemata which are distinctly objectionable (not to say dangerous) after all prostatic operations.

As remarked above, the procedure described by me first in the Journal of the American Medical Association, February 4, 1905, has been successful in every instance in producing a closure of the rectum, and I feel certain that the suprapubic drainage is an addition of very great value to the plastic perineal operation in the successful treatment of these cases, and that by its use this horrible complication of all perineal operations will be relieved of its terrors, and that the ban against attempting closure of recto-urethral fistulæ, which has been placed by most surgeons, will be removed.

As remarked above, however, recto-urethral fistulæ should not occur as a result of perineal operations when properly done. When the operation is done through a small median incision and the prostate removed blindly by brute strength alone, it is impossible to see what is being done and to avoid tearing or injuring the rectum in some cases, but where the open operation is performed, an inverted V-incision used, the central tendon and recto-urethralis muscle exposed by blunt dissection on each side, and carefully divided, thus allowing the rectum to be pushed back carefully from the prostate, and a splendid view thereby obtained, there is little excuse for injuring the rectum, but if it should be injured the tear can easily be seen and repaired (which is not the case with the blind operations done through a median perineal incision).

By carefully drawing together the levator muscles in front of the rectum with a single suture of catgut those cases of post-operative rectal necrosis due to pressure of gauze or straining at stool should be absolutely prevented.

These cases therefore have demonstrated three things:

1. That a rectal break-down is usually due to removal of the support naturally afforded by the levator ani muscles.

2. That it can be prevented by restoring this support by simply approximating these muscles with a single suture of catgut.

3. That recto-urethral fistulæ, once established, can be easily cured by supplying suprapubic drainage, when the fistulæ are repaired.

THE EARLY DIAGNOSIS AND RADICAL CURE OF CARCINOMA OF THE PROSTATE.*

BEING A STUDY OF 40 CASES AND PRESENTATION OF A RADICAL OPERATION WHICH WAS CARRIED OUT IN FOUR CASES, AND AN APPENDIX, COMPILED LATER, CONTAINING THE COMPLETE HISTORIES OF 64 CASES.

By HUGH H. YOUNG, M. D.

The recent publications of Courvoisier,[1] Wolff,[2] Socin and Burckhardt,[3] and Albarran and Hallè,[4] have furnished a considerable stimulus to the study of cancer of the prostate, but although the disease has been shown to be much more frequent than formerly supposed, and the pathological aspects have been well elucidated, practically nothing has been suggested in recent years as a routine operation for its radical cure.

Albarran's startling announcement that in 100 specimens of supposed benign hypertrophy he found more or less pronounced invasion of carcinoma in 14, seems not to have suggested the necessity of a radical excision, and even at this late date we find Pousson[5] and Hawley,[6] advocating a mere enucleating prostatectomy, leaving behind the prostatic capsule, urethra, anterior commissure, the adjacent vesical mucosa and the seminal vesicles—structures which are manifestly in intimate contact with the cancerous lobes.

The importance of early diagnosis and radical methods of removal has been brought forcibly to the writer's attention in the past two years by the sad results arising from his failure to recognize, and operate radically in six cases of early carcinoma of the prostate—several of which ought certainly to have been cured by the operation which he has since carried out in four cases.

The object of this paper is to give in detail:

I. The six cases of early carcinoma in which the malignant nature of the disease was not recognized and a partial operation performed.

* Reported in brief in the Johns Hopkins Hospital Bulletin for October, 1905, in which several inaccuracies appear, owing to the inclusion of three cases subsequently shown not to be primary carcinoma of the prostate (see second footnote).

II. A radical operation, proposed as a routine for cases of cancer of the prostate, with histories of four operated cases.

III. A clinical and pathological study of 40 cases of carcinoma of the prostate.

IV. A comparison with cases in the literature in which operations for carcinoma of the prostate were performed.

V. Conclusions as to the practicability of early diagnosis and the radical cure of the disease.

VI. An appendix, containing detailed reports of 64 cases.

I. The Six Cases of Early Carcinoma in which the Malignant Nature of the Disease was not Recognized and a Partial Operation Performed.

Case I.—*Apparently benign prostatic enlargement. Bottini operation. Well for two years. Development of carcinoma of prostate and bladder. Death.*

S. S., aged 67 years, admitted May 1901. Of. No. 141.

Duration of symptoms, 2 years and 4 months. Onset with slight frequency of urination. After 4 months had retention, was given a catheter which he has continued to use since. Only small amounts of urine can be passed voluntarily. No hematuria. Very little pain.

General examination.—Condition good, no emaciation.

Rectal examination.—Prostate much enlarged, about the size of a small orange. Median furrow far to the right, notch shallow. Right lobe indurated and very little enlarged. Left lobe large, soft, smooth, upper end can just be reached.

Cystoscope shows a very large globular projection from the left lateral lobe into the bladder with a deep sulcus above, slightly to the left of the median line. The median portion has a moderately thick bar which shows a small sulcus between it and the left intravesical hypertrophy. The right lobe does not project into the bladder at all.

Diagnosis.—Prostatic hypertrophy.

Bottini operation.—Four cuts made. For some weeks afterward patient was fairly comfortable, voiding urine naturally, and did not require catheterization.

December, 1901.—Patient urinates every 2 to 2½ hours. Pain running down to head of penis. Passes 2 to 3 small calculi daily. Has lost no weight. Examination shows patient in the same physical condition as when last seen. Prostate is about the same as before operation. Contour smooth, regular, consistence soft. No induration around prostate or in region of the seminal vesicle. Bladder capacity about 240 cc.

Cystoscopic examination.—Behind the prostate an irregular, shaggy, fibrous mass is seen. The exact character of this could not be determined. Study of the prostatic orifice shows that the orifice of the urethra was large; that there was a deep, open fissure behind where the posterior cut

was probably made through the median bar, and on the left side a long pedunculated projection from the left lobe which was freely movable in the bladder.

A suprapubic cystostomy under cocaine was performed and the irregular shaggy mass seen with the cystoscope lying on the trigone was found to be a slough from the Bottini operation covered with calculous deposit. The pedunculated projection of the left lobe of the prostate was excised. The prostatic orifice was found to be covered with smooth mucous membrane and no ulceration was to be felt. Bladder negative. Microscopic examination of the pedunculated lobe showed benign adenoma of the prostate.

March, 1902.—Patient voids urine naturally and without pain. Occasionally passes a small calculus. Has a residual urine of 15 cc. Urine is slightly cloudy and contains pus and bacteria.

For the next year and a half the patient was apparently well. Urine was voided easily and in a large stream; he suffered no pain or discomfort.

He was seen again in October, 1903. At this time he was beginning to have pain in bladder and urethra, but he had passed no blood, although a few weeks previously he passed a small stone. At times he suffers considerably on attempting to urinate and at other times he can void quite freely and without pain. He has not lost much weight. Catheter finds only 18 cc. residual urine present.

Cystoscopic examination.—The surface of the right lobe and median portion is smooth. In the region of the left lateral lobe is a large irregular villous outgrowth, the surface is shaggy and very white in character. The cystoscope has to be passed quite a distance into the bladder before it clears the tumor, showing that the tumor lies on the left half of the trigone. With the cystoscope in the urethra and finger in the rectum a hard ring of tissue is felt around the instrument and both lobes seem indurated. Rectal examination shows that both lobes are enlarged and quite hard, and that there is induration also in the seminal vesicles. No operation was advised, but after several weeks the pain and frequency of urination were so great that suprapubic drainage was supplied. The patient grew gradually worse and died early in 1904.

Partial autopsy was performed in Washington, D. C. Bladder, prostate, and kidneys have been removed in one piece. In separating the bladder from the rectum the seminal vesicles were evidently cut away and left with the rectum. The ureters and kidney pelves are considerably dilated. On section the right kidney shows greatly dilated calices and very much thickened cortex. There is a great deal of exudate lining the mucous membrane of the calices, pelvis, and ureter. The condition of the left ureter is similar to the right, but the pyo-hydronephrosis is not so advanced. The kidney cortex is less abnormal. The bladder, which has been opened in the median line in front and posteriorly down to the prostatic urethra, is invaded almost everywhere by a new growth which presents on the inner surface of the bladder. The general aspect of the tumor is that of a rough cauliflower-like growth, necrotic in appearance. The

prostatic orifice shows a long cleft on the left side lined by mucous membrane, evidently the site of the Bottini incision. The cut through the right lateral lobe is shown only by a scar and the posterior cut is filled up by neoplastic growth. The left lateral lobe projects only slightly into the bladder. The surface is irregularly rough, evidently a neoplasm. The right lateral lobe projects about 2 cm. into the bladder. In places it is covered by fairly normal looking epithelium, but in others by a neoplasm. On section the prostate is, in the hardened specimen, generally white in color with numerous small dots and lines of a grayish color in a fibrous looking stroma. The urethra is not involved except on the floor near the bladder orifice. The general appearance of the tumor on section is, in the hardened specimen, much the same as that of the prostate, and the two are definitely continuous. The seminal vesicles are not present, and there is no evidence of invasion of the growth in the region above the prostate nor back of the bladder. The ureteral orifices cannot be seen, but apparently open into the bladder through the neoplastic growth.

Microscopic study of sections shows carcinoma of the prostate and of the bladder involving the entire musculosa. The prostatic carcinoma shows the stroma everywhere invaded by alveoli of small, round, epithelial cells.* The vesical carcinoma shows numerous epithelial nests or perles.

Case II.—*Large vesical calculus. Apparently benign enlargement of prostate. Suprapubic prostatectomy. Cure. Three years later large retroperitoneal metastases from cancer of prostate.*

E. G. W. Of. No. 228. Aged 67. Admitted November 7, 1901. Suffering from difficulty of urination of two and a half years' duration. Catheter necessary for one year. Of late, severe pain in bladder, and *for six months sciatica on the right side.*

Examination.—Patient in good condition. Prostate considerably enlarged, bulges into the rectum. Contour smooth, regular, consistence very hard, some areas harder than others. Left lateral lobe larger than right. Seminal vesicles not indurated. "Would say prostate was quite sclerotic."

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* Since this was written better sections of the prostate have been obtained, and a careful study shows that what was supposed to be adenocarcinoma of the prostate is in reality alveoli packed with epithelial and polynuclear cells, a process of inflammation and not carcinoma at all. The character of the cancerous process seen in the bladder and at the prostatic orifice is of a squamous epitheliomatous type, and it is evident that it could not have arisen from carcinoma of the prostate but it may have come from the seminal vesicle. Since this discovery one other case with extensive carcinomatous intravesical tumors, and soft smooth enlarged prostate which had been included in discussing the cases, has been found to present a similar condition. In view of these two cases a third case, resembling the above clinically has been excluded from the detailed report of 64 cases given later on.

Cystoscopic examination.—Residual urine 70 cc. A large, rough, irregular calculus present. Study of the prostatic orifice shows intravesical enlargement of both lateral lobes and median portion of slight degree.

Operation, November 9, 1901.—Suprapubic prostatectomy and lithotomy. The entire prostate with the prostatic urethra was enucleated in one piece, the capsule alone being left behind; this was necessitated by the marked adhesion between the prostatic lobes and the urethra. Patient made a rapid recovery and since then has had no difficulty in urination. On *May 25, 1905*, he was again seen. He then said that urination became normal a few months after the operation and had remained so ever since. He can hold urine for 5 hours, has no difficulty in micturition, no pain in the region of the bladder, prostate, or rectum, no hematuria. Five months ago he began to suffer pain beneath the costal margin on the left side, of a dull aching character and never radiating. Consulted surgeons in New York, who made a diagnosis of tumor of the left kidney. Examination shows a large palpable mass in the region of the left kidney, movable on respiration, and extending five fingers' breadths below the costal margin. The liver is enlarged and its surface feels irregular. Analysis of stomach contents shows absence of HCl and Oppler-Boas bacilli.

Rectal examination.—In the region of the prostate there is a hard, elevated mass which extends upward and outward on each side to the pelvic wall to which it is closely adherent as far as the finger can reach. The surface is smooth, but on the left side there is a prominent, large lobule; no nodules, however, are present. Several indurated cords are present in the region of the seminal vesicle on each side. No enlarged glands to be felt, after careful examination of the entire pelvic space. Rectal mucosa soft and not adherent. Examination not painful.

Cystoscopic examination.—Catheter passes with ease. No residual urine present. Bladder capacity 375 cc. Urine almost clear, very few pus cells present. The cystoscope shows a large patent orifice connecting the urethra with the bladder. The mucous membrane covering it is smooth, no prostatic enlargements are to be seen, no evidence of obstruction. Bladder negative.

Examination of the specimen removed by suprapubic operation.—The prostate has been removed entirely in one piece. It is covered by a smooth capsule and contains the prostatic urethra. It measures about 4 x 5 x 6 cm. in size. At the vesical orifice a small median lobe and slight lateral enlargements are seen. Transverse section of the hardened specimen shows small, white, granular areas in a fibrous stroma. Study of the stained sections under the microscope shows adenocarcinoma, principally in the periphery of the gland near the capsule, which is apparently intact.

The carcinoma varies in the amount of gland element which it contains. In areas the acini are very much in excess of the stroma and in places simulate very closely a normal prostatic hypertrophy undergoing active proliferation. The acini are lined by tall cylindrical epithelial cells, apparently quite normal and regular in appearance. In other areas,

however, the unmistakable character of carcinoma is evident. The acini are atypical and lined by an epithelium which has undergone involution. At times the carcinoma becomes infiltrating in character. Again solid alveoli of epithelial cells atypical in character and with but slight tendency to formation of acini are to be seen. In the areolar tissue outside of the prostatic capsule small carcinomatous areas are encountered which preserve an atypical adenomatous form.

NOTE.—This case has been entirely cured of all urinary obstruction by suprapubic prostatectomy three and a half years ago. He suffers only from symptoms in the region of the left kidney and stomach. The markedly indurated mass in the region of the prostate at once suggests carcinoma, and the section, which had not previously been studied, confirms this. The diagnosis of metastases to retro-peritoneal glands, stomach, and liver is therefore made and an operation is not advised.

The patient died during the fall of 1905. No autopsy.

CASE III.—*Diagnosis: Small sclerotic prostate. Bottini operation. Death one year later. No autopsy.*

W. H., aged 56 years, admitted May, 1902. Of. No. 206.

Duration of symptoms, two years. Onset with frequency of urination. This gradually increased until, when seen, he was voiding 20 to 30 times in 24 hours. Considerable straining, some hesitation. Never passed any blood, never any pain on urination, but has a rather severe pain in the region of the sacrum. Thinks he has lost considerable weight.

Examination.—Strong-looking, well-nourished man. Residual urine 400 cc. Has never had complete retention.

Rectal examination.—Prostate is enlarged in a very peculiar manner. The right lobe is symmetrically enlarged, very hard in consistence, and might be called a moderate hypertrophy of the sclerotic type. The left lobe is almost twice as long, the upper end extending up far beyond the upper limit of the right, and directed somewhat outward along the course of the seminal vesicle. This lobe is also broader than the right and projects more toward the rectum. Contour smooth, but the consistence is also extremely hard. The median furrow is obliterated between the two lobes and there is no notch.

Cystoscopic examination showed a median bar of moderate degree, with a round lobule upon each side just before it joined the lateral lobe. The lateral lobes projected very little into the bladder, in fact the contour of the urethra was about normal. With the finger in the rectum and cystoscope in the urethra the prostate was found to form a very hard, thick ring around the shaft of the instrument. The beak of the instrument could not be felt in the bladder beyond. A note made at the time states, "this prostate is the hardest I have ever felt, being of stony consistence. Prostatectomy would be practically impossible to perform on account of induration."

A Bottini operation was done under ether, and he was very much relieved. On discharge he could hold his water about two hours. No pain.

Urine passed with ease. Residual from 75 cc. to 110 cc. He feels very much improved.

He returned again in September, complaining of rheumatism. Has no trouble in voiding urine and voids about twice during the day, but for the past five weeks has suffered pain at the end of his spine and down both legs. He says that pain has been so considerable that he has had to use morphia. (Unfortunately no note made of examination.) He died one year later. No autopsy.

NOTE.—In the light of recent cases, it seems remarkable that I should not have recognized this case at once as one of carcinoma of the prostate.

CASE IV.—*Bottini operation for supposed benign enlargement of prostate. Later diagnosis, carcinoma. Alive five years after onset.*

J. S., aged 68 years, admitted August 1902. Of. No. 800.

Duration of symptoms, two years. Onset sudden with increased frequency of urination about every half hour during the day and several times at night. Considerable precipitancy and pain if desire is not satisfied. This first severe attack gradually wore off, but urinary difficulty gradually increased. Since then he has had periods of varying discomfort. Never much pain, but if present it was in the bladder region. Has not lost any weight. Weighs 202 pounds. No history as to hematuria.

Status præsens.—On entering the hospital he had retention for the first time, about 450 cc. urine being drawn off. Was then catheterized for several weeks, and at one time as much as 1200 cc. removed.

Rectal examination.—Prostate is peculiar, is enlarged, especially in the lateral diameter, and the left lobe is more affected than the right. The finger cannot quite get beyond it. The groove is distinct, but near the apex on the left side an indurated mass of stony hardness, the size of a hazel-nut, can be felt. On the right side a similar but smaller and less indurated mass can be made out. In parts the prostate is soft and pultaceous.

A Bottini operation was performed and an immediate good result obtained. A short time after he had to get up only once at night to urinate and during the day voided every three or four hours, but at times there was considerable blood in urine. He continued to pass his water fairly freely until May, 1904, when he began to use a catheter.

In *December, 1904*, the patient was using his catheter four times a day and the same number of times at night and unable to void any urine voluntarily. "Has no pain at any time except some bladder pain after holding water for several hours. Weighs about 168 pounds and says he has gained about 8 pounds in the last few months."

Examination, December, 1904.—He has general glandular enlargement. The glands in the posterior and anterior triangles of the neck as well as the supraclavicular glands are enlarged, but not especially hard; are freely movable. Some of the glands are 1½ cm. in diameter. Epitrochlears are not enlarged. Glands of groin enlarged, but freely movable, and not particularly hard. No evidence of spinal cord involvement or nerve pressure.

Rectal examination.—Prostate much enlarged, irregular, of stony hardness in places; the upper outlines cannot be reached. The left lobe is larger than the right, its surface is more irregular, containing one large nodule. The induration extends upward and outward, particularly on the left, the upper limit being imposible to reach. It is apparently closely adherent to the lateral bony structure of the pelvis as it extends upward and outward. The prostate itself does not seem to be adherent to the pelvic structures. In the median line above the prostate is an induration between the seminal vesicles. The upper end of this can, however, be passed. Between the rectum and the prostate in the middle line are two small shot-like bodies.

Cystoscopic examination shows three stones. On each side of the bladder to the outside of the probable location of the ureteral orifice was an elevated mass probably a tumor. That on the left side was quite large, and at its summit was covered with an irregular, white, shaggy mass. The prostatic orifice shows two lateral lobes, the left being the largest. Between them there is a deep cleft in front and behind. With the finger in the rectum and cystoscope in the urethra the beak cannot be felt but there is apparently no increase in the median portion of the prostate.

In *February, 1905*, he was catheterizing himself every two to three hours; suffers no pain in legs or thigh, or bladder, but at times has a severe pain in the rectum, the left side, and the back; has lost 10 pounds in the last three months. The stones were removed by litholapaxy. After that he was much more comfortable. Could hold urine longer than before and did not have to catheterize himself for six hours.

May 12, 1906.—Patient returns for examination. He says he is perfectly comfortable, suffers no pain in the bladder, urethra, perineum, rectum, back, hips, legs, groins, or testicles. He has gained 20 pounds since the last operation, and enjoys excellent health. He voids urine at intervals of from two to four hours. He catheterizes himself at bed time and removes 125 cc. residual urine. He does this because he is able to sleep longer and because he finds that a large soft rubber catheter keeps his urethra open, there being a tendency to stricture. Catheterization is accomplished easily without pain or hemorrhage. Passed no blood, no calculi since the last operation.

Examination.—The patient looks well, lips of good color. The anterior and posterior cervical, epitrochlear and the inguinal glands on both sides are enlarged.

Rectal.—There is considerable enlargement particularly on the left side where the consistence is very firm, presenting a very hard sharp edge. The surface is irregular, nodulated, extremely hard and in the region of both seminal vesicles, and between them is an indurated mass continuous with the prostate the upper end of which cannot be reached. On the left side the involvement of the structures above the vesicle is most marked and there is a large mass of glands. On the right side there is considerable involvement, but no glands are felt. The sacral glands are not palpable.

The rectal mucosa is soft and not adherent, but there are a few shot like bodies apparently in the muscle of the rectum.

The urine is slightly cloudy and about 150 cc. is passed at one time. Sp. Gr. 1019, markedly acid, small amount of albumin, no sugar, no casts seen, much pus, many bacilli.

CASE V.—"*Small sclerotic prostate.*" *Bottini operation. Two years later. Carcinoma. Death. No autopsy.*

A. F., aged 60 years, admitted September, 1902. Of. No. 324.

Duration of symptoms, three years. Onset with increased frequency of urination but very little difficulty. Got up two or three times at night and voided every two to two and a half hours during the day. This continued until July, 1901, when he had an attack of acute retention—about 1500 cc. of urine being drawn off. He got along very well without the catheter, although the frequency of urination gradually increased until he was voiding about every two hours night and day. In July, 1902, he had another complete retention; after this he voided naturally, but with increased frequency until about 10 days ago, when he had another attack of retention.

Status præsens.—Voids urine about five times at night and about every one and a half to two hours during the day. Slight pain is present when bladder is full, otherwise none.

Rectal examination.—Prostate enlarged, median furrow shallow, notch shallow, hard to reach beyond it. Left lateral lobe larger than right, more bulging, extends further upward and outward where it is continuous with seminal vesicle. Both are indurated. Left lobe has a very hard surface and somewhat nodular. Right lobe is softer but also indurated. Urine clear. Acid, no albumin, no sugar. Sp. gr. 1021.

Cystoscopic examination.—There is a definite but not very great hypertrophy of the median and two lateral lobes in the shape of a collar with one sulcus in front between the two lateral lobes. The right lobe projects a little more into the bladder than the left. The median bar is moderately thick and elevated above the trigone. A note made at the time says, "we have to deal with a hypertrophy of moderate degree and probably of inflammatory and sclerotic type."

A Bottini was performed and the immediate result was very good. He could hold water five to 6 hours during the night and a reasonable length of time during the day. He remained very well until January, 1904, when he began to have difficulty and increased frequency of urination and considerable pain, and noticed a few months later some blood in urine. In *April, 1904*, was voiding urine with considerable difficulty, every 20 to 25 minutes, "suffers pain in the penis, particularly after urination. Has lost 10 pounds and has suffered a great deal. Complexion sallow; patient looks badly."

Rectal examination.—Prostate very large, transversely twice as broad as normal, irregular in contour, nodular, closely adherent to the rectum, and exceedingly hard. Upper end confluent with nodular, greatly indurated,

seminal vesicle on both sides. Catheter shows from 175 cc. to 400 cc. residual urine.

Cystoscopy.—Examination of the prostatic orifice shows a cleft in front and one low down to the right. The right lateral lobe is in the shape of a rounded intravesical projection. The left lateral lobe is also considerably enlarged. The surface of the median bar and lateral lobe is irregular. With the finger in the rectum and cystoscope in the urethra it is impossible to feel the beak, owing to an indurated mass in the median portion. The cystoscopic examination shows only one Bottini cut.

Urine contains numerous pus cells, no organisms. He was treated by urethral dilation and this improved his ability to void. In October, 1904, a suprapubic operation had to be done on account of difficulty of catheterization and pain in bladder and urethra, and he gradually weakened and died December, 1904.

CASE VI.—*Mistakenly diagnosed "benign hypertrophy." Operation, perineal prostatectomy—enucleation of lobes. Recurrence. Death one year later.*

J. J. S., aged 75, admitted September 18, 1903. J. H. H. Nos. 15,199 and 16,392. Of. No. 420.

Duration of symptoms, three years. Onset with increased frequency of urination and slowness of stream, urination gradually becoming more frequent and difficult. Finally a complete retention of urine, after which he had to be regularly catheterized (18 months). No hematuria. Considerable pain, spasmodic in character when bladder becomes full. This has been present since catheter life began. Pain generally situated in the perineum, but occasionally radiates to the end of the penis and is quite severe. No systemic symptoms.

Status præsens.—Unable to void urine voluntarily. Catheter used every four to five hours. General health fair. Frequent spasmodic pains in perineum.

Examination.—No glandular enlargement. Abdomen and chest practically negative.

Rectal examination.—Prostate considerably enlarged and presses considerably towards the rectum. Shape of prostate symmetrical. Long diameter transverse, size is that of a small apple. Median furrow obliterated, notch shallow, contour slightly irregular and nodular, consistence rather hard, not tender. Seminal vesicles not palpable. Prostate seems closely adherent to the bony pelvis.

Cystoscopic examination.—Study of the prostatic orifice shows that the right lateral lobe projects farther into the bladder than the left, which is rather small. In the median portion there is a small but definite median bar. The surface of the prostate is smooth, no ulcerations seen. Bladder greatly trabeculated and inflamed, capacity 240 cc., tonicity good. No calculus seen. Urine is very foul. Sp. gr. 1017. Reaction slightly alkaline, no sugar. Cloud of albumin. Very large numbers of organisms, both cocci and bacilli. The diagnosis of prostatic hypertrophy was made and

the usual perineal enucleation of the lateral lobes and median bar performed. The lobes were rather hard and adherent and considerable difficulty was experienced in enucleation. The median portion of the prostate was found to be intimately incorporated with the vasa deferentia, and these were unintentionally excised with part of the median bar. Patient did very well after the operation. Two months after he could hold his urine from five to seven hours in the day and voided every three hours at night. The fistula had entirely healed. Ten months after the operation the fistula was again leaking; the stream of urine slow in starting; no pain present, but quite a severe burning sensation along the urethra. Has lost 25 pounds in weight. 500 cc. residual urine found.

On rectal examination a mass of considerable dimensions was felt in the region of the prostate, bulging into the rectum. The seminal vesicles could not be felt, but in that region was a mass continuous with the prostate. In the middle line the upper limits of the prostate could be passed and nothing abnormal felt. General contour irregular, consistence firm but nowhere of very great hardness. The rectal mucosa was not adherent and no enlarged glands were felt. On cystoscopic examination there was a medium sized enlargement of the median portion, and fairly considerable enlargement of both lateral lobes shown. No ulcerations present. Behind the median bar an irregular, ragged mass was seen, which was probably either tumor or a blood clot disintegrating. A Bottini operation was performed. Patient left the hospital slightly improved, but gradually became weaker and died several weeks later.

Microscopic study of the tissue removed from the median portion of the prostate including the vasa deferentia shows adenocarcinoma.

The carcinoma is a very cellular one, and is of the adenoma type, at times becoming infiltrating. The acini at times are very small and so closely set that an intervening stroma is made out with difficulty. At other times the acini are separated by considerable bands of stroma. At numerous points lines of epithelium infiltrating between the stroma bundles are seen, and is often of such a character as to almost suggest round celled infiltration. The epithelium lining the acini is rather of a cylindrical type, but it varies a great deal in shape. This is an adenocarcinoma without any solid tubules, but with occasional areas of a scirrhus type.

Remarks.—The foregoing six cases in which the writer failed to recognize the prostatic enlargement as malignant are worthy of careful attention. In none of them were the classical symptoms of prostatic carcinoma as usually given present. In no case had there been hematuria and in only two cases was pain present and in one of these a large vesical calculus was found. Only one of the patients had lost weight. None presented the features of Guyon's "*Carcinose Prostato-Pelvienne diffuse,*" and the seminal vesicles were indurated in only two cases. The clinical picture of nearly all of the cases was that of sclerotic

prostatic enlargement, which has been so frequently described, and this was the diagnosis made. In four of the cases both lobes were indurated, in the fifth only one lobe and in the sixth there was a hard nodule at the upper end of each lateral lobe. The cystoscope showed very little outgrowth of the lateral or median portions of the prostate into the bladder with the exception of one case (and here this lobe proved to be adenoma). Marked induration and absence of intravesical outgrowths were therefore the two signs common to all of the cases, and these may now be taken as very suggestive of carcinomatous enlargement.

The results of palliative operation in these cases (suprapubic prostatectomy once, perineal prostatectomy once, Bottini operation four times) showed that only by means of much more radical measures and early diagnosis could there be a hope of cure in such cases.

II. A Radical Operation Proposed as a Routine for Cases of Carcinoma of the Prostate with Histories of 4 Operated Cases.

In March, 1904, a gentleman aged 70 years who had been complaining of urinary trouble for only one year, for which a Bottini operation had been performed in Philadelphia, with only temporary benefit, presented himself. He suffered a slight pain in the penis and bladder and perineum on urination.

On examination by rectum, a hard slightly nodular prostate, with a prolongation of the induration into the region of the left seminal vesicle, was felt. The cystoscope showed only a little median and no lateral prostatic enlargement, not sufficient to account for the large residual urine present. There had been no hematuria, no loss of weight, the prostate was not tender, and no enlarged glands were to be felt, but the diagnosis of carcinoma seemed justified, and a radical operation was advised.

The operation proposed was as follows: To expose the prostate and insert the tractor as in my ordinary prostatectomy operation, to free the posterior surface of the prostate, and if the examination confirmed the diagnosis, to cut the prostate loose from the membranous urethra, to divide, the pubo-prostatic ligaments, separate the prostate from the bladder at a safe distance from the prostate, incising the trigone in front of the ureters, and after dividing the vasa deferentia as high up

as possible, to remove the prostate, vesical cuff and seminal vesicles in one piece. The operator also proposed to restore the defect by anastomosing the anterior wall of the bladder to the membranous urethra if that were possible. The patient readily acquiesced, and with the kind assistance of Dr. Halsted the operation was successfully carried out, exactly as planned, April 7, 1904. No great difficulty was experienced in excising the entire prostate and seminal vesicles intact with the vasa deferentia and vesical neck, the enucleation and dissection apparently giving the involved structures a wide berth.

The patient reacted well, the convalescence was good, the perineal wound closed tight, and free urination through the urethra was soon established—in fact the operation was so satisfactory that it seemed demonstrated that with early diagnosis of cancer of the prostate, this radical procedure should give splendid results. During the past year three other cases have been radically operated by the same method and the four cases will be given in detail.

Case VII.—*Carcinoma of prostate. Radical operation. Excision of entire prostate, seminal vesicles, ampullæ of vasa deferentia, and cuff of bladder. Recovery.*

E. H. G., aged 70 years. Admitted April 1, 1904. No. 15,929.

Complaint.—Frequency of urination and pain.

Family history.—Negative.

Past history.—Negative. Up to May, 1903, no urinary trouble.

Present illness.—In May, 1903, he began to have pain in the glans penis during and at the end of urination. At this time there was no increased frequency of urination, no hematuria, no pain anywhere except at the end of the penis. In June, 1903, he began to have pains in the bladder at the end of urination. At this time he also noticed a slight increased frequency, but he did not have to arise more than once or twice at night to urinate. The pain at this time was so great that a physician was consulted and an unsuccessful attempt at catheterization made. After this the frequency of urination increased considerably, but, when catheterized by Dr. M. B. Tinker, whom he consulted about July 1, only a small amount of residual urine was found. Dr. Tinker made a diagnosis of enlarged prostate and referred him to me. During the summer of 1903 he was treated by an "Osteopath" with prostatic massage, with considerable detriment; urination becoming very painful and frequent.

During the fall the symptoms steadily grew worse, and he began to have a slight pain in the perineum and thighs. He then consulted surgeons in Philadelphia, who passed a catheter, drew off four ounces of residual urine, and on December 8, 1903, performed a Bottini operation. After the operation urine passed quite freely, but the pain in the glans penis persisted

and the perineal pain became severe. After six weeks the frequency and difficulty of urination returned, and since then has increased until he now has to void every 15 to 30 minutes. Pain is constantly present, and during urination is severe in bladder and penis. No hematuria. Sexual powers (desire, erections, and emissions) were normal until May, 1903, but began to decrease, and have been absent since June. His weight is about normal.

Examination.—Mucous membranes of good color. Lungs negative; slight systolic murmur at apex of heart. Abdomen negative. No glandular enlargement. Genitalia normal.

Rectal examination.—Prostate considerably enlarged, bulging far into the rectum. The contour is somewhat irregular, surface nodular, consistence hard, and the capsule of the prostate is apparently adherent to the rectum. The lateral borders of the prostate are very declivitous. Median furrow and notch obliterated. The right seminal vesicle is palpable, apparently distended but not indurated. In the region of the left seminal vesicle there is an oblong indurated mass, probably two cm. wide, which is continuous with the upper end of the prostate. A catheter was introduced only after dilatation with filiforms and followers, owing to a considerable contracture of the prostatic urethra. 400 cc. residual urine were present. Urine light amber color. Microscopically, contains no bacteria or pus cells.

Cystoscopic examination.—Very little change in the mucous membrane of bladder. The lateral lobes were not intravesically enlarged and the median portion of the prostate was only slightly elevated above the level of the trigone and showed no marked hypertrophy. Obstruction therefore seemed to be in the anterior or middle one-third of the prostatic urethra.

Urinalysis.—Voided urine; very slightly cloudy; microscopically, a few red blood corpuscles; no bacteria; no pus cells.

NOTE.—The diagnosis of carcinoma of the prostate was made on rectal examination, showing induration of prostate extending into the region of the left seminal vesicle, and the absence of intravesical enlargement. The history of pain before any urinary trouble came on was considered suggestive of malignancy. The patient was sent to the Johns Hopkins Hospital and catheterized regularly several times a day preliminary to operation.

The patient was told that the prostatic enlargement was cancerous, and that a radical operation, in which the entire prostate and seminal vesicles should be removed in one piece alone offer a chance of cure. No promise of good functional result could be made, but the patient readily acquiesced in the operation.

THE RADICAL OPERATION.

April 7, 1904. Operation. Ether. Radical excision of prostate, seminal vesicles and cuff of bladder through perineum. Anastomosis of anterior wall of bladder to membranous urethra. Closure of remainder of vesical opening.

With the kind assistance of Dr. Halsted the operation was performed as follows:

An inverted V cutaneous incision was made in the perineum as in the operation employed by me for simple hypertrophy of the prostate—each branch of the incision being about two inches long. By blunt dissection the end of the bulb and central tendon were exposed, and the latter divided, exposing in turn the recto-urethralis muscle, the division of which gave free access to the membranous urethra behind the triangular ligament. Urethrotomy upon a grooved staff was followed by intro-



FIG. 1.—After transverse section of urethra.

duction of the prostatic tractor, which was opened out after it reached the bladder. While traction was made upon this instrument, the rectum was carefully separated from the prostatic capsule by blunt dissection until the entire posterior surface of the prostate was brought into view. Up to this point the operator proceeded exactly as in the usual prostatectomy operation. The tissues around the prostate were more hemorrhagic and the wall of the rectum more closely adherent to the capsule of the prostate than usual. Examination of the prostate then showed much greater induration than I had ever encountered in a benign prostate. The rectum

and the periprostatic tissues were free from invasion. Complete excision was therefore decided upon, and carried out as follows: The handle of the tractor was depressed, thus exposing the membranous urethra anterior to it, where it was easily divided transversely with a scalpel, leaving a small stump of the membranous urethra protruding from the posterior surface of the triangular ligament. By further depressing the handle of the tractor the puboprostatic ligament was exposed, and being very tautly

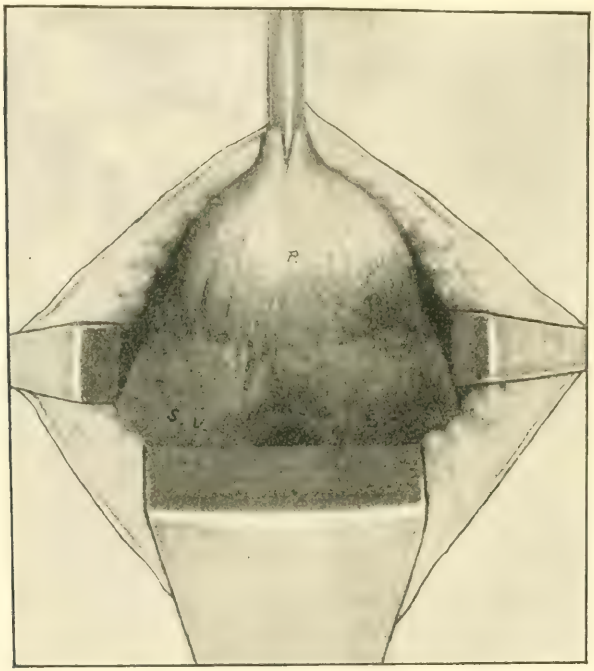


FIG. 2.—Exposure of the seminal vesicles.

drawn, easily divided by scissors, thus completely severing the prostate from all important attachments (except posteriorly), as shown in Fig. 1. The lateral attachments, which are slight, were easily separated by the finger. During these manipulations a moderate amount of hemorrhage was encountered (coming from the periprostatic veins, particularly those just behind the triangular ligament in front of the prostate), but it was easily controlled by clamping several bleeding points, and applying pressure with gauze by means of an anterior deep retractor (see Fig. 3).

The posterior surface of the seminal vesicles were then freed by blunt dissection, the now mobile prostate being drawn well out of the wound, as

shown in Fig. 2. In this exposure of the posterior surface of the vesicles I was careful not to break through the fascia of Denonvilliers, which covers not only the posterior surface of the prostate but also of the seminal vesicles, which forms, I believe, an important barrier to the backward growth of the disease.

The next step was to expose the anterior surface of the bladder, which was easily done by depressing the tractor and making strong traction.

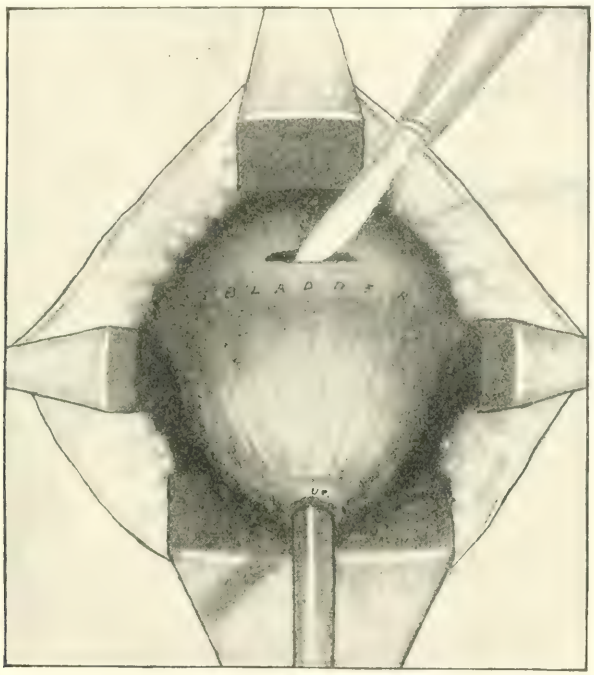


FIG. 3.—Incision into bladder just above prostate.

By this procedure the bladder was drawn down so close to the skin wound that it was easily incised at a point in the middle line about 1 cm. above the prostato-vesical juncture, as shown in Fig. 3.

By means of scissors the division was continued on each side until the trigone was exposed, Fig. 4. After swabbing away the blood and urine the ureters were easily found and the line of incision carried across the trigone with a scalpel so as to pass about 1 cm. in front of the ureteral orifices.

While still making traction upon the prostate, the base of the bladder was pushed upward with the handle of the scalpel, thus exposing the

anterior surface of the seminal vesicles and the adjacent vasa deferentia (Fig. 5), all of which were carefully freed by blunt dissection with the finger as high up as possible, so as to remove with the vesicles as much circumjacent fat and areolar tissue as possible on account of the lymphatics which they contained. The vasa deferentia, after being drawn down as far as possible, were picked up on a small blunt hook and divided with scissors high up, care being exercised to see that the ureters were

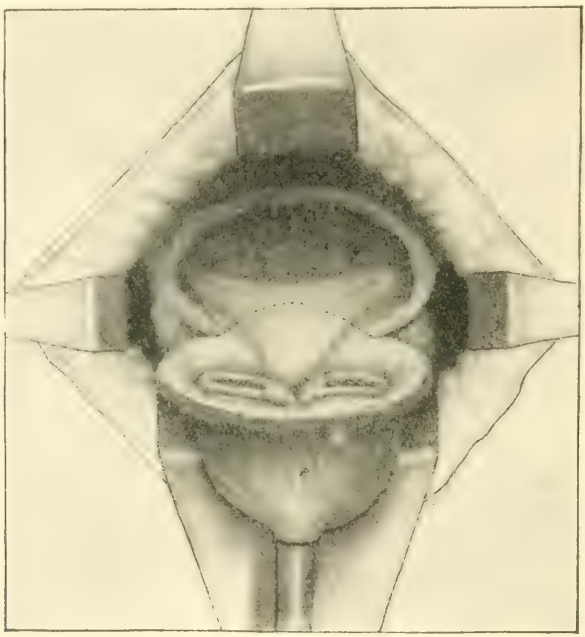


FIG. 4.—Exposure and division of trigone.

not in danger. After division of the vasa the seminal vesicles were found to come down more readily, and the deep adhesions were finally divided, and the mass shown in the photograph (Fig. 6) removed. As seen here in the side view, a portion of the membranous urethra, the entire prostate with its capsule intact, the seminal vesicles, 4 cm. of the vasa deferentia, and a cuff of the bladder 1 cm. wide along the anterior and lateral surfaces and 2 cm. wide in the region of the trigone, have been removed in one piece. Fig. 7 shows the posterior view of the tissues removed.

There now remained a large defect to be repaired. The vesical opening was about 8 cm. in diameter and had sunk far back into the depths. The stump of membranous urethra had been obliterated by the compression of

the anterior retractor so that it was necessary to insert a soft rubber catheter through the urethra from the meatus to discover it. The anterior wall of the vesical opening was then caught with forceps, and with no great traction I was surprised to find how easily it could be drawn down to the membranous urethra, where an anastomosis was readily made, as shown in Fig. 8. The first suture was placed by inserting the needle into the triangular ligament above the urethra and out through the anterior wall

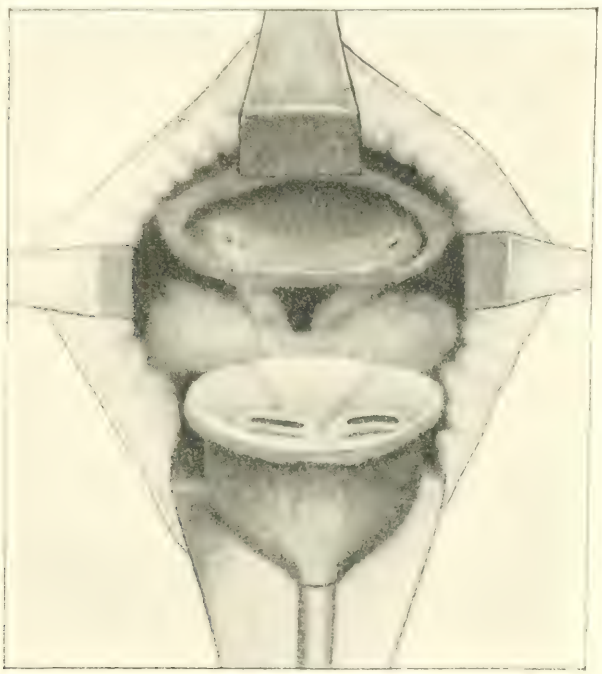


Fig. 5.—Final separation of seminal vesicles and division of vasa.

of the membranous urethra, then through the anterior wall of the bladder in the median line, from within out, care being taken to include only the submucosa and muscle. When this suture was tied the median line of the anterior wall of the bladder was drawn to meet the median line of the roof of the remaining membranous urethra, the knot being outside, and the thread left long. Fig. 9 shows diagrammatically the plan of vesico-urethral anastomosis described above.

Lateral sutures, similarly placed (including the periurethral muscular structures below), and two posterior sutures completed the anastomosis of the membranous urethra with a small ring into which the anterior



FIG. 6.—Photograph of specimen. Side view.



FIG. 7.—Photograph of specimen. Posterior view.

portion of the margin of the vesical wound had been fashioned by the tying of the sutures, as shown in Fig. 8. The remainder of the vesical wound now presented as a longitudinal opening, which was easily closed by sutures, placed as shown in Fig. 8, thus completely closing the defect and replacing the prostatic urethra with a funnel-shaped process made from the bladder wall.

The sutures used were silk, one end of each being left long and brought

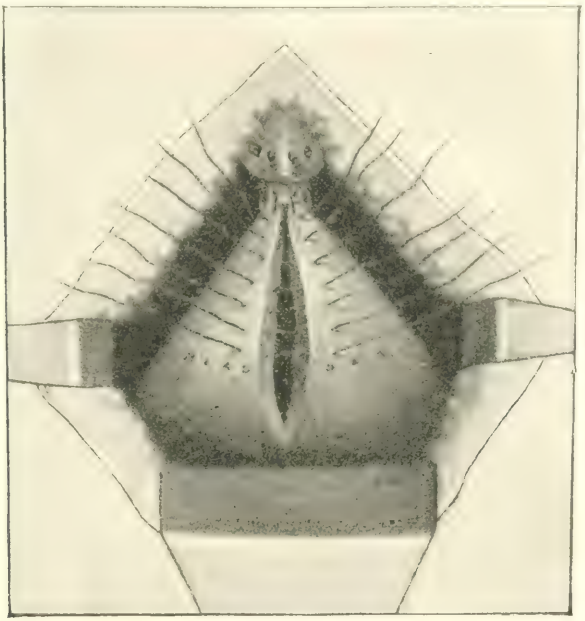


FIG. 8.—The anastomosis of anterior wall of bladder to urethra has been made. The rest of vesical opening is being closed.

out of the wound so that they could be extracted later (since then I have found alternate sutures of catgut and silk-worm gut, also left long, the best). After light gauze packing had been placed in various portions of the wound, the levator ani muscles were drawn together with catgut (two sutures) in front of the rectum and the skin wound closed on each side with interrupted catgut sutures, leaving only a small portion open at the angle in front for exit of the gauze drainage.

The retained rubber catheter (which was of considerable service in making the anastomosis of the urethra and bladder) was fastened in place, by adhesive plaster around the penis, and the patient was returned to the ward.

During the operation he received 1000 cc. salt solution infused beneath the breast, and his condition throughout was good, pulse varying from 65 to 92, and 80 at the end of the operation, which required two hours.

DESCRIPTION OF SPECIMEN REMOVED AT OPERATION.

Gross description.—Specimen consists of prostate, prostatic urethra, seminal vesicles, a cuff of the bladder including the anterior portion of the trigone, and the ampullæ of both vasa deferentia (Figs. 6, 7).

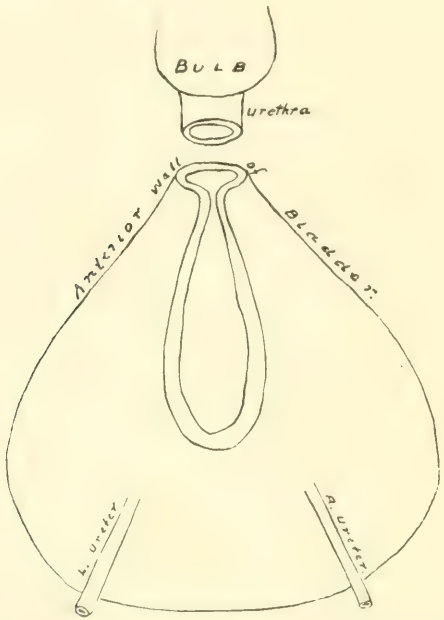


FIG. 9.—Diagram showing plan of vesico-urethral anastomosis.

Prostate is smooth, symmetrical, moderately enlarged, measures 5 x 4½ cm. Its lateral edges are distinct and its surface has been cleanly dissected from surrounding tissues. Its upper limit on the left side merges into the vesical, but on the right side there is a groove between the lower limit of the vesical and the upper limit of the prostate. There is no median groove nor definite notch. On section the prostate consists of firm, white, fairly homogenous tissue. Here and there can be seen areas where the glandular structure is more apparent, but the general picture on cross section is that of fibrous tissue.

Vesicles.—On the right side the vesicle is continuous with the prostate, and is quite hard to the palpating finger. On the left side it stands out

as a distinct separate structure and is soft on palpation. The tissue between the vesicles is firm, but does not stand up as a definite ridge. However, the notch of the prostate and the tip of the intervesicular space are obliterated by bulging of the carcinomatous growth. The right vesical, on section, is itself normal and not invaded by the tumor. On the left side the growth has extended much more towards the vesicle, and in a section across the middle of the vesicle the anterior wall of the vesicle is seen to be invaded by the growth which lies between it and the trigone, but the posterior surface of the vesicle is normal in appearance and its cavity is not invaded. The vas deferens on each side has been removed for a distance of about 4 cm., and at point of section each appears healthy. An apparently encapsulated mass of carcinoma extends up along the outer side of the left vas deferens to within 1 cm. of its upper end, and it seems probable that the tumor has not been given a sufficiently wide berth here. The cuff of the bladder removed with the prostate measures from 2 to 3 cm. wide. It is apparently free from neoplastic invasion except in the anterior portion of the trigone, where it is adherent to the intervesicular mass of carcinoma and is apparently invaded. The mucous membrane is everywhere intact, and at point of excision the bladder seems healthy.

Study of the stained sections shows the entire prostate to be replaced by adenocarcinoma, in most places as a solid type (carcinoma solidum). The prostatic capsule has not been penetrated by the carcinoma, quite a wide intact area of fibrous tissue being present. The urethra has not been invaded but the ejaculatory ducts are completely plugged with carcinoma cells, and this condition is present for a considerable distance along the vasa deferentia, but the upper ends are free. The tumor has not penetrated the capsule of the seminal vesicle as supposed, and both vesicles are free from disease, but between them and the bladder just above the upper end of the prostate a mass of carcinoma about 1 cm. wide is seen. In the muscle of the anterior part of the trigone several lymphatics with cancer cells are seen but at the upper limit the bladder wall is healthy.

Convalescence: April 8.—Patient reacted well. Pulse 90. Temperature 98.2°.

April 14.—Patient has done well since the operation. All gauze has been removed from the perineal wound and the catheter is out of the urethra. Urine escapes through perineum.

April 21.—Patient doing well. To-day passed a little urine through the urethra.

April 30.—Considerable urine comes through the urethra. Silk sutures (fastening bladder to urethra) still hold firmly and cannot be pulled out.

May 20.—General condition excellent. Patient walks about and sits up every day. All silk sutures have been removed. He is free from pain and there is only a slight leakage of urine through the perineum. Sometimes he goes two to three hours without voiding.

May 23.—Perineal wound closed tight, all urine comes through the penis. General condition excellent.

May 30.—Patient discharged from hospital. At night he can hold urine for several hours until the desire to urinate comes on when he empties his bladder. Does not wet the bed. During the day the urine is apt to dribble away, but this is controlled by a padded jock-strap.

July 25.—Letter: "I have steadily gained in strength. Can now work for several hours with comparative comfort. Am troubled with incontinence in the day but do not wet the bed at night."

December 22.—Patient improved steadily for five months after the operation. Intervals between urinations becoming longer and incontinence gradually diminishing. In October he began to suffer pain at the end of the penis during urination. His general health is excellent and he weighs 170 pounds again. He has no pain in back or limbs.

Examination.—Patient in excellent physical condition. Abdomen, groins, and genitalia negative. Rectal examination shows small amount of induration in the region of the operation. On the left side high up a narrow elongated indurated mass, about as wide as a lead pencil and extending out towards the spine of the ischium, is felt. Its contour is round, surface smooth, and there is no infiltration around it. Its position is that of the vas deferens. Silver catheter meets an obstruction about the triangular ligament, but filiforms pass with ease, and dilating followers are easily introduced. A stone is felt in the bladder. The bladder capacity is 110 cc. the tonicity good. The cystoscope shows two small stones in a shallow pouch on the right side of the bladder, and just behind the triangular ligament a small stone, which is attached to a silk ligature, is seen in the bladder cavity. The urethral outlet of the bladder is in the shape of a funnel, the mucous membrane being thrown into hypertrophied folds. The ureteral orifices cannot be made out.

December 23.—Operation. Ether. Litholapaxy. Two of the stones were easily crushed and removed, but the one which was attached to the ligature in the floor of the bladder could not be removed with the lithotrite; it was finally extracted through the urethra by means of a long curved clamp, the ligature and a small bit of mucous membrane coming with it.

December 30.—On the day after the operation patient's temperature arose to 103.3°, but since then has gradually decreased and is now about normal. There has been considerable tenderness over the bladder since the operation, but this is slowly decreasing. (The writer had pneumonia at this time.)

January 1, 1905.—The perineum has become quite swollen and tender, and to-day a urinary fistula opened up in the site of the old scar.

January 8.—An indurated mass is present on the right side of the bladder. Tenderness here is acute. Perineal sinus draining freely. Catheter passed and bladder washed out.

January 9.—Operation. Incision and drainage of perivesical abscess of right side. A large cavity containing pus and foul smelling urine was found communicating with the bladder on the right side through a necrotic opening.

January 15.—Patient has improved rapidly. Temperature normal.

January 20.—Patient became suddenly worse yesterday. Drowsy, nauseated, temperature subnormal. To-day he gradually grew worse and died at 7 a. m.

Autopsy.—The bladder is much contracted but the healing between it and the urethra has been excellent. There is no sign of recurrence in the bladder. The kidneys, ureters, and urethra normal (prostatic urethra absent. There was no sign of recurrence or of glandular metastases anywhere to be made out, but just back of the bladder a small indurated area about 1 cm. in size was present and a section of this shows carcinoma. The bladder and rectum were both healthy. A large abscess cavity connecting with the perineum and bladder on the right side was present.

Case VIII.—*Carcinoma of prostate involving seminal vesicle. Radical excision of prostate, vesicles, vasa and cuff of bladder. Recovery. Subsequent death from uremia.*

W. R., aged 64, admitted September 14, 1904. No. 16,675.

Onset with increased frequency of urination three years ago. Frequency and difficulty of urination has gradually increased until three weeks ago patient was voiding 10 to 12 times during the day; no pain present. Complete retention of urine for the first time one week ago. No history of hematuria. Has lost very little in weight. For the past week catheterization has been necessary.

Examination.—A well-nourished man with mucous membranes of good color. General physical examination negative; no enlarged glands to be felt. Genitalia normal.

Rectal examination.—Prostate is moderately enlarged, the left being larger than the right lobe. The surface is smooth, consistence hard, inelastic, but not nodular. The induration is general over the entire posterior surface of the prostate. There is no enlargement or induration in the region of either seminal vesicle, but in the space between the two there is a distinct plateau of induration extending 1 or 2 cm. above the upper limits of the prostate. Above this the tissues feel soft. No indurated glands or lymphatics are to be felt in the region of the seminal vesicles along the lateral walls of the pelvis or in the sacral fossa. The rectal mucosa is soft, not adherent, not ulcerated.

Cystoscopic examination.—Catheter passes easily. Bladder capacity 300 cc. (bladder at present irritable). Cystoscope shows a slight intravesical enlargement of the median portion of the prostate which is continuous with an elevation or thickening in the anterior part of the trigone. The lateral lobes of the prostate are slightly enlarged, and between them in front is a shallow cleft. Both ureters are easily seen and normal in appearance. The mucous membrane covering the prostate around the orifice and the trigone is everywhere healthy in appearance. The bladder wall is trabeculated slightly but otherwise normal in appearance. No evidence of vesical neoplasm. With the finger in the rectum and cystoscope in the urethra the median portion of the prostate is considerably

thicker than normal and above the prostate beneath the trigone is a small indurated mass. No induration in the region of either seminal vesicle.

NOTE.—The diagnosis of carcinoma of the prostate was made here upon induration, the intervesicular mass, and the absence of intravesical hypertrophy.

Operation, September 23, 1904.—Total excision of prostate and seminal vesicles, a portion of the vasa deferentia, the entire trigone including the ureteral orifices and a small cuff of the bladder.

The operation was done exactly as in Case VII. When the posterior surface of the prostate was exposed it was found on palpation to be so densely indurated that a positive diagnosis was made without cutting into it. When the trigone was exposed, after an incision through the anterior and lateral wall of the bladder, palpation showed an indurated condition of the musculature of the trigone which seemed to extend up to the region of the ureteral orifice. It was therefore thought advisable to excise the ureteral papillæ and a portion of the posterior wall of the bladder immediately above the trigone. A portion of the intramural course of the ureter was left undisturbed and it was hoped that this would leave sufficient sphincter on each side to prevent an ascending infection. No difficulty was experienced in excising the seminal vesicles, about 4 cm. of the right vas and 6 cm. of the left vas along with the prostate, as shown in the accompanying photograph of the posterior surface (Fig. 16). Anastomosis of bladder to stump of membranous urethra was easily performed, catgut being used in this case (on account of the difficulty of removing the silk in Case VII). Submammary infusion of salt solution during the operation. Patient stood operation well. Pulse at end 85.

Examination of specimen.—Specimen consists of the entire prostate, prostatic urethra, trigonum, anterior and lateral walls of the bladder, both seminal vesicles, 5½ cm. of the left and 4½ cm. of the right vas deferens, and a separate piece of tissue, 4 x 4 cm. in size, from the base of the bladder. The vesical muscle here feels hard, but the mucosa appears normal and section of the muscle does not show definite carcinoma. The prostate is surrounded by smooth unchanged capsule. The consistence is very hard, but there are no nodules. On section the tissue is smooth, shining, fibrous, hard to cut, but not gritty and specked here and there with small yellowish pin-point to pin-head areas intermixed with a fibrous stroma. On the right side the growth has not extended towards the bladder, except at the anterior portion, just under the capsule, where it has almost reached the vesical mucosa. On the left side it has just stopped short of the bladder, having apparently passed through the prostatic capsule. The mucosa of the trigone is apparently normal and uninvaded, and while the muscle feels indurated and pale in color it is not definitely carcinomatous. The seminal vesicles are both soft, filled with yellowish, glairy fluid, and apparently normal on section. The left vas deferens is indurated and thickened near its junction with the seminal vesicle. Section at various points shows a normal appearance. The right

vas deferens is thickened but otherwise normal. After hardening in alcohol, transverse serial sections of the specimen were made. These show the urethra to be circularly constricted but uninvaded. The carcinoma has invaded the space between the seminal vesicles and the trigone, and microscopic sections show that the anterior portion of the trigone has been invaded by the neoplasm, and that the lower portions of the vasa deferentia are involved. Sections from the bladder wall in the region of the ureters show no carcinoma, and it is evident that the disease has been thoroughly removed with a wide, healthy area above. The entire specimen weighs g. 110, measures 6 x 8 x 8½ cm.

Microscopical examination.—Section from the prostate about the middle of the prostatic urethra shows an adenocarcinoma. The acini are nearly all small, at times numbers being closely packed together and separated by rather thin bands of stroma. The acini, however, in none of the areas simulate very closely normal culs-de-sac. There is a great tendency for the carcinoma to infiltrate between the bands of stroma, and in considerable areas it loses almost entirely its adenomatous character and becomes of an infiltrating type. Occasionally solid carcinoma tubules are encountered. The epithelium varies greatly in character, that lining the acini being mostly of a cylindrical type. In the infiltrating portions the epithelial cells are quite polymorphous. The nuclei show great variations, at times very small, again large, and at other times extremely large. The contour is mostly round, although they may be very irregular in shape. Sections from the bladder wall in the region of the trigone and from the upper portion of the left seminal vesicle, and from different portions of the periprostatic tissue are negative for carcinoma. The malignant growth is an adenocarcinoma with a marked tendency to infiltration.

Convalescence.—September 29, six days after operation. Patient convalesced poorly. There was considerable nausea for three days but no fever. The gauze drains were removed on the third day. The urethral catheter has not drained at all.

October 6.—General condition improving, but patient is mentally erratic. Considerable dermatitis around perineal wound.

October 13.—Patient has gained decidedly in weight and strength. Wound dirty.

October 20.—Patient has not gained during the past week; has no rise of temperature, but is restless. Dermatitis much improved.

November 5.—General condition apparently failing. Appetite poor. Perineal wound widely patent, draining considerable foul alkaline mucous.

November 8.—Since last note the patient has failed gradually but steadily. He is unable to take nourishment, has had several severe night sweats. Temperature subnormal. No definite signs of uremia, but his pulse is very weak. Later, patient died during the night.

Autopsy, November 9.—Anatomical diagnosis: Perineal wound, diphtheritic and hemorrhagic cystitis, ureteritis and pyelitis. Arterio-sclerosis.

Chronic diffuse nephritis. Cardiac hypertrophy and dilatation. Chronic myocarditis, endocarditis, and emphysema of lungs. Chronic perihepatitis, splenitis, pancreatitis.

The perineal wound leads into a cavity lined with granulation tissue and in direct communication with the bladder, which has a large opening in its inferior aspect. The anterior wall of the bladder is continuous with the urethra, the sutured portion in this region having united. The posterior sutures have evidently broken down. The connection between the urethra and the bladder shows no evidence of stricture. The right ureteral orifice is covered by a small calcareous mass, which is closely adherent to it. The left ureteral orifice cannot be found, apparently opening at the wound. The kidney and pelvis show acute inflammation with exudate. False membranes cover the calices. An acute ureteritis is present on both sides. It is evident that there has been an ascending infection from the bladder. Careful examination failed to reveal any carcinoma. The region of the wound, the rectum, the bladder, and the other pelvic structures show no carcinoma, no metastatic glands. Sections for microscopic study were taken from the left vas deferens near its lower end, the bladder wall near the left ureteral orifice, the rectum posterior to the wound, and the right vas deferens. There is no evidence of carcinoma in any of these sections.

Note.—From a careful study of the specimen removed at operation and the autopsy it is evident that the malignant disease had been completely removed. The extensive excision of the base of bladder, including the ureteral orifices, was not necessary and unquestionably led to the ascending infection which caused the death of the patient. The use of catgut proved a mistake, as it led to rapid breaking down of the wound.

Case IX.—*Cancer of prostate involving seminal vesicles and anterior portion of the trigone. Radical excision of prostate, seminal vesicles, cuff of bladder, ampullæ of vasa deferentia. Recovery. Restoration of urination through urethra. Well thirteen months after operation.*

S. R. B., aged 65 years, admitted February 4, 1905. Of. No. 829.

Four years ago the patient began to have slight frequency of urination, which has increased gradually until he now voids at times as often as six times in an hour. Has never had complete retention of urine, nor has he been catheterized. Has never had hematuria. For two years has had an intermittent pain in the left hip radiating down to the knee, sometimes on the outer side and sometimes on the inner side. During urination there is a slight pain in the region of the pubes. He has a constant dull pain in the back, bladder, perineum, and rectum. His sexual powers were good up to four months ago. He has not lost weight.

Examination.—Patient is well nourished. Mucous membranes of good color. No glands palpable in neck, axilla, groin, or pelvis. Heart and lungs negative. Abdomen negative. Genitalia negative.

Rectal examination.—Prostate is considerable enlarged, both lateral

lobes project towards the rectum and the edges are precipitous. General contour rounded, smooth, consistence very hard and incompressible even on considerable pressure. At the upper end of the prostate, on each side, there is an indurated mass occupying the area of the seminal vesicle and running upward and outward, and in the median line between these two there is a small connecting plateau of indurated tissue, the upper edge of which presents a smooth, concave border. The examining finger can apparently reach above the area of the induration. It is easy to pass it in the median line and the bladder above it feels soft, but on the left side above the upper end of the seminal vesicle the tissues feel tense, but no nodules and no definite induration are to be felt in this region. The rectal mucosa is soft and not adherent.

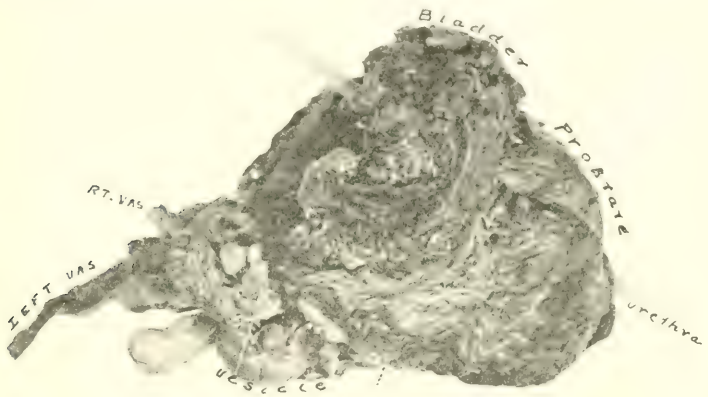


FIG. 10.—Lateral view of specimen from Case VIII. Case II, side view prostate and vesicle.

Cystoscopic examination.—Coudè silk catheter passes with ease. 500 cc. residual urine found present. The cystoscope shows a healthy vesical mucous membrane, considerable trabeculation, especially of the posterior wall. The ureteral orifices are normal in appearance. The prostatic orifice, shows slight enlargement of the median portion, continuous without intervening clefts, with very slightly enlarged lateral lobes, between which there is no cleft in front. With the cystoscope looking downward and the handle depressed, the trigone can barely be seen over the median portion of the prostate. By gradually elevating the handle of the cystoscope the interureteral bar and a portion of the trigone becomes visible, but the anterior portion of the trigone is concealed behind the median enlargement. The mucous membrane covering the prostate and trigone is smooth; no ulceration; no intravesical tumor; no suggestion of involvement of the bladder wall. With the finger in the rectum and cystoscope in the urethra there is considerable thickness in the median portion and it is impossible to feel with accuracy the beak of the instrument in the bladder.

The diagnosis of carcinoma of the prostate was made upon the presence of induration involving the seminal vesicles and the area between them, the absence of much intravesical prostatic enlargement and pain. A radical operation was therefore decided upon.

February 16, 1905.—Operation. Ether. Excision of the entire prostate, cuff of the bladder including most of the trigone, both seminal vesicles and vasa deferentia. The prostate was exposed as in the usual prostatectomy operation and tractor inserted through the membranous urethra. Palpation of the prostate showed marked induration and one very hard nodule on the posterior surface. The diagnosis was considered sufficiently positive not to cut into the prostate. A radical operation was then done according to the method described in Case VII. The lower end of the left ureter was unintentionally divided at its junction with the bladder, the entire intramural portion being removed along with the trigone (this accident was due to the use of straight scissors instead of curved ones while dividing the lateral wall of the bladder). The incision across the trigone was made with a knife and the lower end of the right ureter was spared. The seminal vesicles, and 4 or 5 cm. of the vasa deferentia, were removed along with the prostate in one piece. Anastamosis of the divided left ureter into the bladder wall was easily made by poking a hole through the bladder with a small artery forcep, at a point about 2 cm. above the vesical wound, grasping the cut end of the ureter and drawing it through the hole. It was held in place by means of two small catgut sutures in the bladder and one fine silk suture outside of the bladder. The bladder was easily drawn down and anastamosed with the stump of the membranous urethra, silk worm gut being used for this purpose. The rest of the vesical opening was closed with alternate silk worm gut and catgut sutures, one end of each suture being left long so as to project from the wound to facilitate subsequent removal.

Description of specimen.—It consists of prostatic urethra, both seminal vesicles, portions of the vasa deferentia, most of the trigone including the left ureteral ridge and 1½ cm. of the lower end of the left ureter. The prostate is smooth, symmetrical, moderately enlarged (measures 5 x 5 x 3 cm.). The upper limit of each lateral lobe merges into the seminal vesicles, both of which are enlarged, and between the seminal vesicles is a mass also continuous with the prostate, as shown in the accompanying photograph (Fig. 11). The consistence of the prostate is very hard and resistant but homogeneous. The right seminal vesicle was quite hard, cord-like, and continuous with the intervesicular mass. The left is soft but the tissue beneath is indurated. The posterior surfaces of the vesicles and the prostate are smooth, and the neoplasm has apparently been completely removed. The cuff of bladder wall removed with the prostate measures from 2 to 4 cm. in width, being widest in the trigone, where it contains the intramural portion of the left ureter. The mucous membrane covering it is smooth and there is no appearance of involvement. Numerous transverse serial sections have been made of the hardened specimen.

The section is white with small grayish dots and lines. It is distinctly fibrous in feel. The urethra is intact, although surrounded closely by the tumor which has invaded the entire prostate. A fairly thick intact capsule surrounds the prostate everywhere except at its upper end, where the growth has spread upward around the lower ends of the vasa deferentia and seminal vesicles and invaded the posterior surface of the anterior part of the trigone. A cross section through the tip of the seminal vesicles and the trigone presents the following picture. Above, the darkly stained mucosa of the trigone apparently intact, immediately beneath this a mass of carcinoma, 2 cm. wide, adherent to and involving

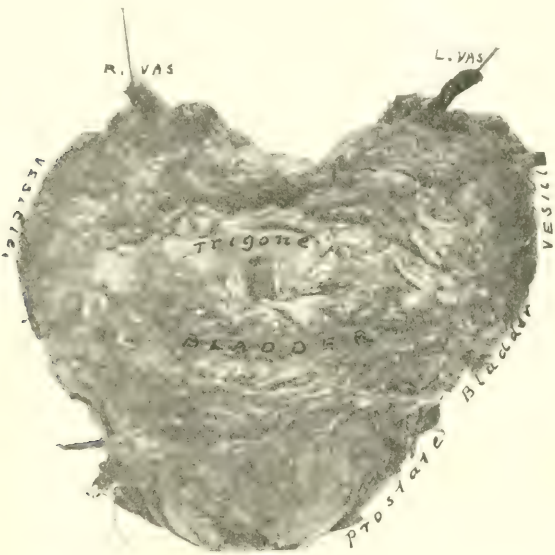


FIG. 11.—Anterior view, showing trigone, urethral orifice, the vasa and prostate.

the seminal vesicles beneath. Sections of the upper portion of both seminal vesicles examined microscopically are found free from disease, but the vas deferens is involved fairly high up on each side, the lumen being completely filled with cancer cells. The bladder wall, near the upper line of excision, is apparently free from invasion, but in the fat beneath it and to the outer side of the seminal vesicle small masses of cancer cells are seen. The capsule covering the prostate and seminal vesicles is invaded on the inner side in places. The structure of the neoplasm is adenocarcinoma; in places carcinoma solidum.

Microscopic examination.—The predominating type is that of an adenocarcinoma although occasional areas of scirrhus are encountered. There

seems to be quite a marked tendency of the carcinoma to arrange itself in large tubules. The lumina of these tubules are filled with epithelium arranged in atypical acini. There is practically no stroma between the various epithelial strands. There are at times a number of these carcinomatous tubules closely set together separated by comparatively thin bands of stroma. On superficial examination these tubules often seem like pure carcinoma solidum, but on closer examination one finds nearly always a marked tendency to formation of acini. Occasionally, however, alveoli are seen which are composed entirely of epithelial cells without any disposition to assume glandular form. Not infrequently irregular masses of epithelial cells are found infiltrating the stroma. At other times these infiltrations are assuming an adenomatous type. The carcinoma extends up along the vesicles showing the greatest tendency to involve the vas, and at times masses of carcinoma are found in the alveolar tissue outside. Sections from near the top of the seminal vesicles and including the vas at this level show the vesicles free from infiltration, but the wall of the vas and the immediately surrounding areola tissue is involved. This extension of the disease involving the vas preserves well an adenocarcinoma type. The epithelium forming the acini is mostly of a low cylindrical variety. In the infiltrating areas the epithelial cells are often small and round but may be of various sizes and shapes. The nuclei vary much in size and in their staining properties.

Convalescence.—Patient reacted well from the operation.

February 20.—Patient up in bed to-day. Slight nausea. Appetite fair.

February 22.—There has been a good deal of nausea and vomiting. Pulse 100 to 110. Perineal gauze drainage partly removed, most of urine coming through the perineum.

February 23.—Nausea and vomiting marked to-day. Temperature 102.5°. Saline infusion and salt solution by rectum. There is a large pressure slough across the small of the back, due to prolonged pressure against a hard sand bag at the operation.

February 25.—Condition improved; no nausea; up in a chair for two hours.

March 2.—General condition good. A portion of the urine now passes through his penis.

March 9.—Walking to-day for the first time. Wound doing well. Condition excellent.

March 14.—Temperature arose to 102.6° yesterday; no special symptoms.

March 17.—On March 15, temperature 103°; on the 16th, 102.5°; to-day, 102.2°. Patient has had no pain. Examination of kidneys is negative; no tenderness in region of bladder. The wound looks well; urine is escaping freely through the perineum. To-day three silk worm gut sutures were removed; three remain. No evidence of calcareous deposit along sutures (in marked contrast to Case VII, in which the sutures were coated with lime salts).

March 22.—Large superficial skin slough on the back is causing patient

considerable trouble. Large piece cut away with scissors to-day. Patient still has some rise of temperature but is up and about.

April 9.—Patient up each day. Feels weak but is gaining strength. Temperature up and down each day. Urine passed through penis in large quantities the first time yesterday. Wound on back much improved.

May 17.—Back healing slowly. Perineal wound closed. When patient lies on his back there is no leakage or dribbling of urine from his penis, but when he is on his feet he has no control of it. During the night patient holds urine for several hours, voiding 450 cm. in the morning. Urinalysis 1250 cc. Cloudy, pale, acid; sp. gr. 1010; albumin present in a small amount. Pus cells and bacteria numerous. Urea 12 grams to the litre.

May 30.—Patient has gained eight pounds since operation, feels well, can walk long distances. There is no pain in the region of the perineum, of bladder, or in hips (all of which were in constant pain before operation). Does not wet the bed at night. Holds urine for three to four hours, then gets up and voids it. During the day time has no control. Has had no erections since operation.

Examination.—Condition excellent. Wound completely healed. Rectal mucosa soft; no evidence of recurrence in region of wound or above. No glands to be felt.

June 24, 1905.—Patient says he feels very well. Voids urine about every two hours night and day. When the desire to urinate comes on he has to attend to it at once or it will escape. Does not wet the bed at night. Wound healed tight. Rectal mucosa soft; no glands to be felt in pelvis. Slight induration in region of operation, a little more marked on the left side. No definite evidence of recurrence. Urine pale yellow color, fairly clear, heavy ring of albumin is present, one hyaline cast is seen.

March 12, 1906.—Letter. "After leaving the hospital I was very comfortable and gained 20 pounds in weight. About September 5, an abscess formed in the region of the operative scar, this was followed by a small fistula through which a portion of the urine escaped, the rest passing through the natural channel into the rubber urinal which I have never ceased to wear when up and about. On January 1, 1906, I had an operation performed to close the fistula. The wound closed readily and I was discharged January 19. The fistula has not reopened. I have no control over my urine. I now weigh 167 pounds, 23 pounds more than when I left the hospital. My appetite and digestion are very good."

Case X.—*Carcinoma of prostate. Complete excision of prostate, seminal vesicles, ampullæ of vasa deferentia, cuff of bladder, and one enlarged gland. Recovery. Closure of perineal fistula in four weeks. Well one year later.*

J. E. D., aged 64, admitted May 12, 1905. No. 930.

Onset of symptoms about one year ago with some straining on urination. Voided urine about every two hours during the day, but only once at night. After a few weeks the urinary symptoms disappeared and he

was comfortable until seven months ago. Urination then became difficult, stream small, and urination frequent during the day, but he only had to get up once at night. A catheter was passed and sixteen ounces of residual urine were found, and after that he was catheterized once a day for a month and was treated by prostatic massage without benefit. Two months ago he began to use the catheter himself and has continued to use it two or three times a day until the present time. In the evening the residual urine was about 12 ounces, but in the morning he was able to void more freely and finds only about six ounces of residual urine present. Patient has had no pain in the region of the bladder, rectum, back, or legs. Has not lost weight and is heavier than he has ever been. He has satisfactory sexual intercourse several times a week. Ejaculations not quite so free as formerly. Has not had hematuria.

Examination.—Patient a healthy looking man. Lips and mucous membranes of good color. Chest and abdomen negative. No enlarged glands to be felt.

Rectal examination.—The prostate is considerably enlarged. The left lateral lobe is much larger than the right, bulges much farther toward the rectum, has a very sharp lateral border, and extends farther upward into the region of the seminal vesicle. The upper limits of this lobe are difficult to make out distinctly, owing to the fact that several indurated cords run upward and outward from the upper end of the prostate apparently between the seminal vesicles and the rectum. No glands are to be felt in this region. The left seminal vesicle cannot be distinctly made out, but there is definite induration in this region. The consistence of the left lateral lobe is much harder than that of the right. Surface smooth, contour rounded, consistence everywhere equal and no nodules are present. It is extremely tender on pressure, especially near the apex, where it is quite prominent. The induration is not of stony hardness, but is much harder than that of the ordinary prostate. The right lateral lobe is moderately hypertrophied, oval in shape, smooth, elastic, not tender, and not nearly so indurated as the left lobe. Upper end well limited; no extension in the region of the left seminal vesicle, which is soft. The bladder above is soft; no glands are to be felt; no intervesicular mass present.

Careful examination of the lateral walls of the pelvis and the sacral fossa failed to reveal any enlarged glands.

Cystoscopic examination.—Catheter passed with ease. Residual urine varies from 100 cc. to 400 cc. Cystoscope enters easily, is not distinctly grasped in the prostatic urethra as in some cases. Study of the prostatic orifice shows an enlargement of the median portion in the shape of a small sessile lobe. The lateral lobes are very little enlarged and the cleft between them is shallow. Between the lateral lobes and the median enlargement there is a shallow cleft on each side. The surface of the prostate is smooth and the mucous membrane normal in appearance. Both ureteral orifices are easily seen and are normal in appear-

ance. There is a slight pouch behind the median enlargement. The bladder wall is considerably trabeculated with numerous pouches and one or two cellules between. There is no neoplastic growth to be seen. Mucous membrane is smooth, red, moderately inflamed. With the finger in the rectum and cystoscope in the urethra the beak can easily be felt. There is no marked induration or increased thickness in this region, but the median portion of the prostate is considerably thicker than normal and, by turning the beak to the right side of the trigone, palpation shows a distinct increase in thickness in the region of the left seminal vesicle. Prostatic secretion, obtained by massage, is composed almost entirely of spermatozoa, some of which are actively motile, a few lecithin cells, very few granule cells, and some epithelial cells.

Remarks.—The diagnosis of carcinoma of the prostate is made on the induration, preponderance of size, and great tenderness of the left lateral lobe, its extension into the region of the seminal vesicle, and the absence of marked intravesical enlargement around the prostatic orifice.

May 16. Operation.—Radical excision of entire prostate, seminal vesicles, ampullæ of the vasa deferentia, circular cuff of the bladder, including the trigone to within 1.5 cm. of the ureteral orifice. Anastomosis of anterior wall of bladder to the stump of the membranous urethra. Retained catheter in penis. Partial closure of skin wound on each side.

After introduction of the tractor through the membranous urethra the rectum was found to be more closely adherent to the capsule of the prostate than usual, and had to be dissected away, leaving instead of a smooth shining prostatic capsule, as usually seen, a rough hemorrhagic one. Palpation of the prostate showed that it was very much harder than in true hypertrophy, and on the posterior part of the right lateral lobe near its external border, a hard, sharp, irregular ridge was felt. The diagnosis of carcinoma was confirmed without cutting into it and a radical operation carried out with very little difficulty. Ureters not injured. Bladder wound successfully closed with silk worm gut sutures. Entire time of operation, including complete closure two hours and fifteen minutes. Just before closure one enlarged gland was found adjacent to left seminal vesicle and removed. Submammary infusion during the operation.

Pathological examination.—The prostate, with its capsule and urethra, both seminal vesicles, vasa deferentia for a distance of 3½ cm., a cuff of the bladder, which is 2 cm. wide in the region of the trigone, have been removed in one piece. The excised bladder is lined by normal looking mucous membrane and shows no evidence of malignancy. The prostatic orifice shows a small round middle lobe, and a slight enlargement of each lateral lobe, each covered by smooth mucous membrane. The capsule of the prostate is rough, particularly on the anterior and posterior surfaces, where small adherent bits of tissue are seen. It measures 5 cm. wide, 4 cm. long, and 5 cm. thick. It is hard in consistence, but no nodules nor glands are to be felt. The cut surface of the prostate is generally yellowish in color with small, granular, yellowish areas separated by a fine

stroma of lighter color. The capsule of the prostate is apparently not invaded and the urethra is also free from disease. Section of the middle lobe shows the same picture as described above. The urethra is intact and free from disease. The vasa deferentia are normal in size, smooth, not nodular, but feel quite firm. The left seminal vesicle is closely bound to the upper end of the prostate. It measures 1.5 x 2 cm. in size, and has the appearance of a benign atrophied vesicle. Both seminal vesicles are surrounded by a fatty areolar tissue, but there is no evidence of carcinoma in it. The right seminal vesicle is about the same size as the left, is soft in feel, and shows no evidence of involvement. There is no tumor mass between the seminal vesicles and the bladder.

Microscopic study from sections of both lateral lobes shows adenocarcinoma which has entirely replaced normal structures. Sections of the seminal vesicles show that both are invaded by carcinoma near the prostate, but are free from disease higher up. The vasa deferentia are both filled with cancer cells near the prostate, but sections taken at a point 1 cm. below the upper limit of excision are normal. A longitudinal section through the trigone and middle lobe of the prostate shows no involvement of the trigone. The apex and posterior portion of the middle lobe is composed of muscle and fibrous tissue and is not involved. Along its anterior surface and beneath the urethra several masses of cancer cells are seen. The capsule of the prostate and the areolar tissue around the seminal vesicles show no invasion.

Convalescence.—Patient reacted well. Highest temperature 100.2°F., reached on second day. No leakage from perineal wound. Urethral catheter removed on seventh day, after which all urine passed through the penis for two days.

May 26.—Most of urine is passing through perineal wound but without pain. Temperature normal. General condition excellent. Sutured skin wound healed per primam. Patient up in chair.

June 9.—Several silk worm gut sutures removed for the first time to-day.

June 15.—Nearly all the urine passes through the penis but without control. Rubber urinal ordered. General condition excellent.

June 22.—No leakage through perineum but has no control of urine through penis. Two silk worm gut sutures remain.

June 27.—Patient discharged. General condition is excellent. Suffers no pain. Urine passes entirely through his penis. Perineal wound healed tight with the exception of a pin-point opening at apex, where one stitch remains which cannot be removed.

Examination of rectum is negative. No enlarged glands to be felt; no evidence of carcinoma in region of wound. Rectal mucosa soft. Glands of groin not enlarged. General condition of patient excellent.

The microscopic character of the carcinoma varies in different areas, in one portion atypical acini still persisting, while in other areas there is assumed carcinoma simplex. The growth as a whole is a very cellular one, the epithelium varying in size and shape as also do the nuclei.

Oftentimes the carcinoma is arranged in large alveoli in which the cells are compact with formation here and there of small open spaces. The epithelium shows a marked tendency to infiltrate the stroma, and infiltrating strands and nests of epithelium can be seen in numerous areas. Sections taken from the vesical end of the lateral lobes show a complete replacement of the normal tissue by cancer, but the carcinoma has not broken through the upper end of the capsule to involve the urethral orifice, but has apparently broken through at the junction of the vesicles and vas with the prostate.

Diagnosis.—Adenoma carcinoma and carcinoma simplex, the latter predominating.

May 5, 1906.—Letter. "I am in good health and weigh 196 pounds. The incontinence is the same as when in Baltimore. The urine is light colored and copious in amount. I may say that I am in exactly the same condition as when last seen by you. I was operated on one year ago to-day. About two or three weeks after it, my foot began to swell and was sore to the touch; it has never gotten entirely well, but gives me very little trouble."

III. A Clinical and Pathological Study of 37 Cases of Cancer of the Prostate.*

Nineteen of these were patients at the Johns Hopkins Hospital, service of Dr. Halsted, whom I wish to thank for the privilege of reporting on them. Twenty-one are from the records of my private cases. The histories of these 40 cases while occasionally incomplete have furnished considerable material for a clinical study, the tabulated results of which, I will take up successively.

Age.—The ages were as follows:

1		53 years.
8	between	55 and 59.
12	"	60 " 64.
9	"	65 " 69.
5	"	70 " 74.
1		75 years.
1		76 years.

As seen here 57% are between 60 and 70 years of age and 95% between 55 and 75. This is in accord with the statistics of Julien,[7] who says that cancer of the prostate generally occurs between 60 and 70 years of age. In 100 cases collected by Kaufmann,[8] all were over 40, only eight under 50, and 68% between 50 and 70.

* As stated in a preceding footnote (Case I), three cases will have to be excluded, as being cancer of the bladder probably not arising from the prostate.

Wolff [2] found 6 cases in the literature under 40, one 29. Guyon [9] has reported a case aged 34 with diffuse prostato-pelvic carcinosis, and one of Billroth's [10] cases was only 30 years of age. These cases were reported many years ago, however, and all recent statistics show that carcinoma of the prostate is rarely seen before 50 years of age. Some of the supposed cases in early years may have been sarcoma, which occurs in young people.

Onset.—In 26 cases the first symptom was frequency of urination, in eleven associated with more or less difficulty of urination. In many cases both of these symptoms gave little trouble for some time, and in one case no urinary trouble developed at all. One case began with sudden retention of urine; as a rule, however, this came on much later, and in only six cases persisted. In 4 cases complete retention occurred intermittently. Pain was noted at onset in only 11 cases and in 3 of these it was only a slight burning pain in bladder at or before urination. It was located three times in the penis, twice in the hip and once in the rectum. The pain was severe in only a few cases. In one the first and only symptom was a severe pain in the hip. Hematuria occurred only twice at onset, and in one case it remained the only symptom for six months. This case, however, showed extensive involvement of the bladder.

These statistics of the onset of disease are not in accord with the commonly accepted beliefs which have given pain and especially hematuria more prominent roles.

LATER SYMPTOMS.

Pain.—This was present in 27 cases, not present in 8, not noted in 5. It was noted as occurring in the following regions—often in several in the same case.

Bladder	9	(5 slight.)
Penis	6	
Perineum	4	
Rectum	3	
Leg	3	(sciatic.)
Thigh	3	
Sacrum	2	
Testicle	3	
Abdomen	2	
Hip	2	
Groin	2	
Knee	1	
Sole of foot	1	

The vesical pain was frequently only a slight burning or irritation during or immediately before or after urination, occasionally it was severe and spasmodic in character and reflected to the abdomen or the rectum. Very characteristic is the pain which begins in the rectum and radiates down the sciatic nerve, sometimes even to the sole of the foot (as in one case).

It generally occurred on the side in which the disease had involved the region of the seminal vesicle. The pains are generally of a severe aching, exhausting character and only occasionally lancinating.

Hematuria.—In 20 cases a specific note has been made that there has never been any hematuria and in 12 cases no mention has been made of it. In only 7 of the 37 cases, is it stated to have been present. In four of these it was severe in character, and in one of these villous tumors of the bladder were present, in the third the trigone was nodular and superficially ulcerated, and in the fourth no cystoscopy or autopsy were obtained. In the other cases hematuria was an insignificant affair, and intermittent in character even in one case in which large intravesical tumors were present. Excluding the cases in which vesical tumors were present hematuria has been a rare symptom and of little consequence. It seems rather to be suggestive of vesical tumor than simple cancer of the prostate, and is certainly not so commonly present as it has been in many cases of benign hypertrophy of the prostate, in the middle lobe forms of which it is no uncommon symptom.

Retention of Urine.—In all cases but one some residual urine was present, in 20 cases incomplete retention, in 7 cases complete retention requiring catheter life; and in 6 cases intermittent complete retention. In 8 cases no note has been made on this point.

An early large residual urine has been quite common, and sometimes associated with little evidence of obstruction. One patient said that he had no difficulty or frequency of urination, and was surprised when 500 cc. residual urine was found. Except when invaded by the disease, the bladder was seldom contracted, and as a rule it was found remarkably healthy even when frequent catheterism had been necessary. The passage of a catheter has frequently shown a contracture of the prostatic urethra, a sensation of firm and rough resistance immediately on entering, which was entirely different from the obstruction to the catheter experienced in ordinary hypertrophies, in which the instru-

ment generally traverses a considerable distance in the prostatic urethra before being abruptly stopped by the obstruction (the middle lobe).

Clinical Examination. Prostate.—The prostate has been described as considerably enlarged in 23 cases, moderately enlarged in 8 cases, and only slightly enlarged in 5 cases. The consistence was hard in 30 cases, in places hard and in others soft in 5 cases, nodular in 17 cases and soft in no cases. Marked tenderness has only been noted once in the 37 cases. In this case (Case X, completely reported above) the left lobe of the prostate contained near its apex a prominent rounded enlargement which was extremely tender on pressure. Other portions of the prostate although shown later to be carcinomatous were not tender. Sixteen of the cases were described as nodular. In the great majority of the cases, however, only a slight irregularity of surface was present and no marked nodules. In those cases which were not very far advanced in the disease the prostate often presented a smooth rounded surface, but markedly indurated. This induration was most often of stony hardness. At times there was a softer induration which gave way somewhat on pressure. The contrast, however, between the induration in these cases and the usual elasticity of the ordinary hypertrophied prostate was very marked.

Seminal Vesicles.—It was in the region immediately above the prostate on each side in which the most significant changes were found, and induration in one or both of the seminal vesicles was found in 29 cases. In two cases in which the vesicles were said to be free from disease, the prostatic carcinoma presented into the bladder and vesical tumors had developed. In one case it was uncertain whether the vesicles were involved or not and in two cases no note was made. In a few cases the involvement above the prostate was in the shape of a small rounded indurated mass at the lower portion of the seminal vesicles. Generally it extended well up for the entire distance of the seminal vesicle and frequently it continued upward and outward to the pelvic wall and beyond the reach of the finger, but these cases were seen late.

In such cases the examination usually revealed a mass in the shape of a bundle of indurated cords with intervening deeper indurated and soft areas extending upward and outward from the upper end of the prostate to which it was closely adherent. In only three cases were enlarged pelvic glands noted.

In recent cases, where more careful notes have been made, an induration in the intervesicular space has been noted in ten cases. This presented as a flat hard plateau above the prostate in the middle line, continuous with the seminal vesicle on one or both sides and usually presenting a sharp curved upper border, above which sometimes the soft bladder could be felt. This intervesicular mass of induration which has been shown microscopically to be composed of infiltration of the tissues around the vasa deferentia and between them and the bladder, is, I think, the most positive clinical finding of carcinoma of the prostate. I know of no other condition in which it occurs and it always means that the disease has travelled upward for a certain distance at least above the prostatic limits.

In 4 cases the rectum was pushed back and partially occluded by the prostatic tumor, but in only two cases were notes made that the rectum was involved by the growth, and in but one of these was it ulcerated. Involvement of the rectal wall certainly occurs very late in the disease, as shown by these cases.

The Bladder.—The bladder was examined cystoscopically in 20 cases. In 17 it was found normal with the exception of cystitis, trabeculation, and pouch formation. In three cases intravesical tumors were present, once single, once double, all of a villous type. The single and double tumors were in the region of a ureteral orifice. In one case the trigone was ulcerated and nodular and in another case there was a peculiar plateau in the anterior part of the trigone behind the prostatic orifice. Examination of the bladder by suprapubic cystotomy showed no involvement in one case, and a nodular elevated trigone in the other. Two autopsies showed the bladder to be uninvolved.

The intravesical portion of the prostate.—Study of prostatic orifice with the cystoscope showed no enlargement in 5 cases. In 12 cases there was a slight elevation of the median portion of the prostate in the shape of a small bar. In 3 cases a very small rounded median lobe was present, and in one case a fairly large median lobe. The lateral lobes were intravesically enlarged in only 4 cases and in one of these it was slight. In 3 cases the intravesical prostatic outgrowth was villous in type and associated with tumors of the bladder in three cases. (These 3 cases are now excluded. See footnotes.)

Glandular Involvement.—Enlarged glands have been noted in only

11 of the 40 cases as follows: Deep pelvic glands four times, inguinal five times, iliac twice, sacral twice, axillary once, epitrochlear once.

In recent cases I have made very careful examinations with the object of palpating if possible enlarged pelvic glands (as these are the nearest to the seat of the disease) and only twice have been able to detect them, although in several cases extensive involvement above the seminal vesicle on one or both sides was present. In many of these cases indurated lymphatics could be easily felt extending upward and outward, but even on bimanual palpation no pelvic or iliac glands could be felt. In one case a small bunch of glands could be felt about the middle of the sacral fossa, high up, along the posterior wall of the rectum, and in another case, in which examination for pelvic glands was negative, operation disclosed a carcinomatous gland at the upper end of the left seminal vesicle. It therefore seems certain that the absence of palpable glands is of very little prognostic value.

This corresponds to the findings of Kaufmann,[5] who discovered involvement of the pelvic glands in only 27 out of 100 autopsies. In one of our cases in which the tibiæ, vertebræ, and ribs contained numerous metastases, only one metastatic gland and that a bronchial gland was found.

Loss of weight was considerable in 18 cases and slight in 3. No notes were made on this point in 9 cases and it was absent in 7. In several of my cases in which the carcinoma had spread to the region of one or both of the seminal vesicles the patient still felt strong and had lost nothing in weight. In several other cases an early emaciation was noted. As the disease progresses this symptom is unquestionably very characteristic.

Increase in thickness in the suburethral portion of the prostate.—After cystoscopy, but before withdrawal of the cystoscope, it has been my custom for several years to insert the index finger of the right hand into the rectum to ascertain the thickness of the posterior commissure (particularly the "median portion" beneath the vesical orifice) and the trigone and tissues beneath. In many cases of prostatic hypertrophy although a considerable increase in the median portion of the prostate is detected, it is possible to feel the beak in the bladder and show the absence of tumefaction between the trigone and the rectum. The anterior half of the posterior commissure is usually found to be little thicker than normal and soft.

In these cases of carcinoma the findings have been entirely different,

the entire suburethral portion of the prostate—the posterior commissure has been found thicker and harder than normal, the prostate appearing as a hard thick ring firmly grasping the cystoscope. It has generally been impossible to feel the beak, thus showing a tumefaction beneath the trigone in the intervesicular space. By directing the beak of the cystoscope far to one side it has been possible to get a more accurate idea of the region of the seminal vesicle, and the extent of any involvement which be present.

This increase in thickness and hardness in the suburethral and subtrigonal tissues, taken in conjunction with the presence of little or no intravesical prostatic enlargement has proved a very important diagnostic finding.

The pathology as shown in 8 autopsies and 8 operations.—We have not the space to go more than briefly into the varied phases of carcinoma of the prostate. That it may begin in a benign adenomatous hypertrophy is shown in Case No. 9 (in appendix) in which a section of the lobes removed at operation showed benign adenoma.

A localized hard rounded mass in each lateral lobe surrounded by soft prostatic tissue was found in Case IV, and here again, after a Bottini operation the patient felt well for two years, when extensive malignant disease of prostate, vesicles, and bladder was discovered.

In most of the cases, however, there was a marked induration often of stony hardness, generally smooth, sometimes rough and nodular, and involving both lobes.

The operations and autopsies have both shown a remarkable freedom of the outer portion of the capsule of the prostate from neoplastic invasion. In sections which show not a remnant of the original glandular structure of the prostate left, the prostatic capsule is seen to be intact. Some of the inner layers occasionally show small masses of cancer cells in the lymph spaces and along the course of the nerves and blood-vessels, but the outer layer still uninvaded. Sometimes the disease passes through the capsule and invades the rectum, but generally very late. As is well-known the posterior surface of the prostatic capsule is rendered much thicker and stronger by the incorporation of the firm prostato-peritoneal aponeurosis of Denonvilliers, which covers intimately the posterior surface of the prostate and the seminal vesicles and passes on upward beneath the posterior parietal peritoneum. The base of the prostate between the ejaculatory ducts and the bladder, not having the support of this strong fascia is covered by a

much weaker capsule, and it is here that the disease passes beyond the limits of the gland proper. Cross sections in this region frequently show the seminal vesicles and vasa deferentia filled with cancer cells, with their outer fibrous walls intact, showing conclusively that the disease has travelled up the ducts. In one case an apparently healthy vas deferens was found to be filled with carcino-

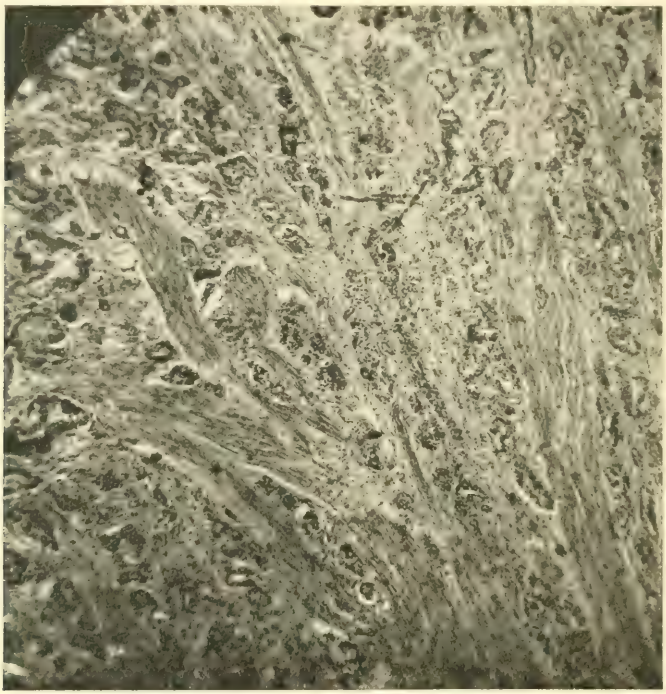


FIG. 12.—(Case 13.) Schirrous form of adeno-carcinoma.

matous elements at a point 4 cm. above the prostate. The lymphatics, and nerve sheaths are also common avenues for transmission of the disease, and can often be palpated by rectum as firm rounded cords running upward and outward beneath the fascia, sometimes completely masking the seminal vesicle.

Several of my specimens show beautifully the intervesicular plateau of infiltration, spoken of before. It is found to be composed microscopically of masses of cancer cells in and around the vasa deferentia

and between them and the base of the bladder. In these cases the outer layers of the bladder muscle are usually found invaded by narrow prolongations of the disease. In several instances this extended a very short distance up the trigone, the bladder being entirely healthy before the region of the ureters was reached. The mucosa is rarely broken

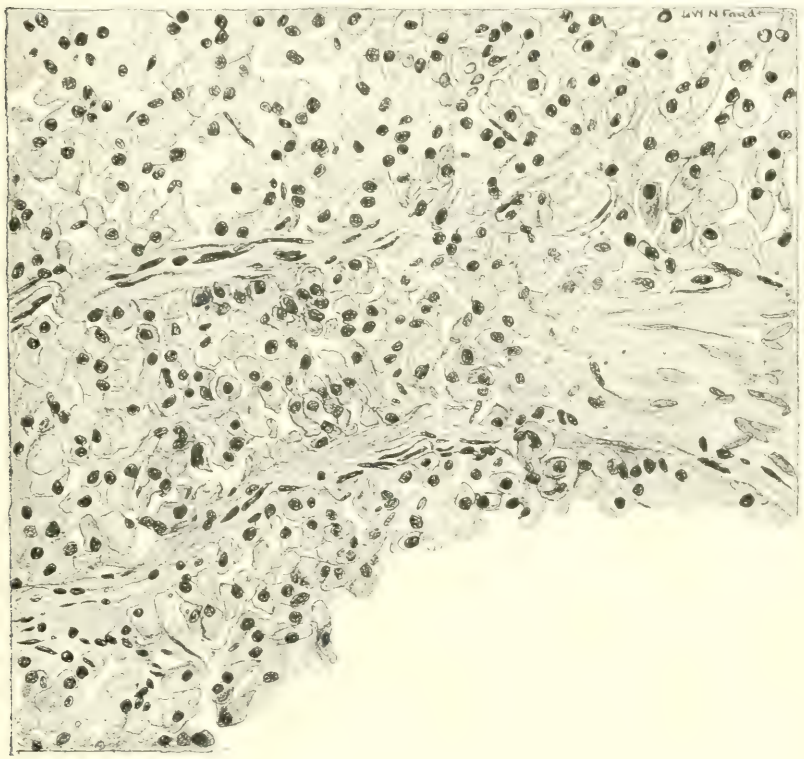


FIG. 13.—(Case 64.) A medullary form of carcinoma in which there is very little stroma and the cancer cells varying in size and shape are loosely arranged.

through. In three of these cases the trigone was invaded, once elevated, once ulcerated, and once the site of a polypoid tumor. In those cases in which the cystoscope shows slight enlargement of the prostate around the vesical orifice, the disease, if it invades the bladder at all, attacks the trigone, and if an intravesical tumor appears it is usually near one of the ureteral orifices. I have

seen one such case in which there was a direct continuation of the disease from a carcinomatous seminal vesicle through the bladder wall into a small papillary tumor at the right ureteral orifice.



FIG. 14.—(Case 10.) A tubular form of carcinoma in which solid strands of epithelial cells are seen growing into the lumina of the tubules and by their union forming irregular open spaces. There is no infiltration of the stroma.

Microscopically the types of carcinoma vary in the prostate as they do in other organs.

The most common type is a mixed adenocarcinoma and carcinoma simplex, this being the form present in 11 of the 18 cases in which

microscopic examinations were made. Four of these showed some areas of pure adenocarcinoma while other areas presented the scirrhus type. These might be termed a scirrhus variety of adenocarcinoma. Fig. 12 (Case 13) is an area of scirrhus from one of these cases.

In seven cases the adeno type varied with portions in which the epithelium formed islands of cells separated from each other, sometimes by slender and sometimes by broad bands of stroma. Often,

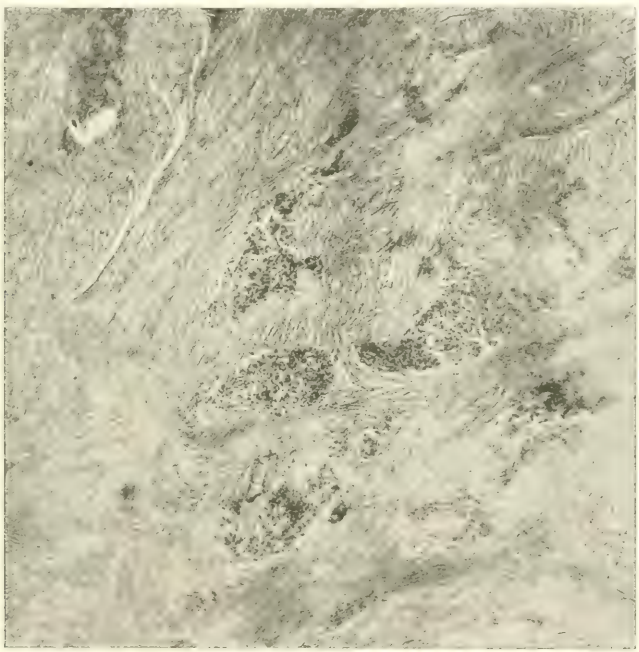


FIG. 15.—(Case 10.) Nests of cancer cells lying in between dense bundles of muscle.

however, the carcinoma is seen breaking through these limiting bands of stroma and infiltrating lawlessly so that the alveolar arrangement may be entirely lost.

In three cases the neoplasm was a carcinoma simplex; two of the medullary and one of the scirrhus type.

Fig. 13 from Case 64 represents the very cellular character of one of these medullary tumors, and the insignificant amount of stroma present. A large portion of the tumor was of this character. It is

seldom that the carcinoma presents a pure adenoma type, but it exhibits a marked tendency to infiltrate. The acini may be reproduced



FIG. 16.—(Case 9.) A small carcinoma nodule about 2 mm. in diameter in an otherwise benign prostate. Some of the normal acini still persist in the cancerous area.

in quite a regular manner, but it is seldom they simulate closely a normal acinus.

In two cases the prostatic tumor was what might be termed a tubular form of adenocarcinoma. Fig. 14 (Case 10) represents an area from one of these cases. Sections from the portions are very similar in character and present this same peculiar structure. Only very occasionally was any tendency to infiltration displayed, although the growth had partially invaded the deeper layers of the capsule.

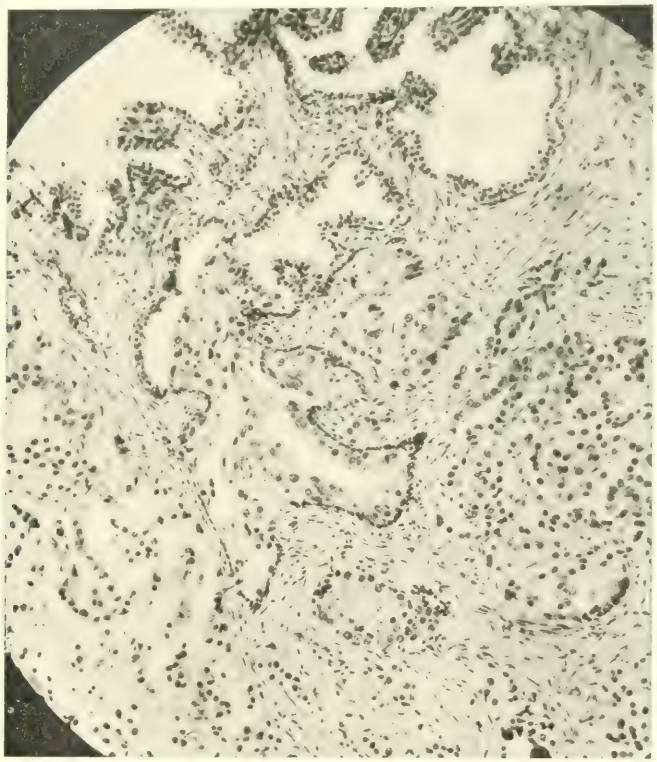


FIG. 17.—(Case 14.) Shows an acinus partly lined by cancer cells and partly by normal epithelium. The cancer cells are large and pale staining.

In one portion of this tumor there was present a marked hyperplasia of the muscle in which islands of cancer cells were irregularly distributed. (See Fig. 15, Case 10).

In two cases the neoplasm was principally pure adenocarcinoma. In one a small nodule of cancer about 1 mm. in diameter was found (see Fig. 16, Case 9). About ¾ of the nodule is included in this

drawing, which includes some of the normal tissue surrounding the cancerous area.

Fig. 17 (Case 14) is shown principally because it contains an acinus one portion of which is invaded by cancer while the other portion is lined by normal epithelium.

Metastases. Microscopic examination of the metastatic growths were made in four cases. In one (Case 13) the primary tumor was a scirrhous variety of adenocarcinoma, and sections from the glands showed pure adenocarcinoma.

In another (Case 64), the original growth was a cellular carcinoma simplex (Fig. 13), while the extensive metastases were all colloid. In a third case the metastases and prostatic tumor were similar, both being tubular adenoma.

In the fourth case the glands were the seat of a diffuse carcinomatous invasion, while the original growth was a mixed one—adenocarcinoma and carcinoma simplex.

IV. A Study of the Cases in the Literature in which Operations for Carcinoma of the Prostate were Performed

I find 26 cases of primary carcinoma of the prostate reported. To these I have added 6 cases from my own practice (here reported). I have not included cases in which the Bottini operation was employed (omitting thus 6 of my own cases). The cases of carcinoma of the rectum involving the prostate and of sarcoma of the prostate which have been included by Oraison, Pousson, and Hawley have no place here, but I have referred to them briefly to show why they should be excluded. I have grouped these cases, according to the operation performed as follows:

Partial Operations. (Enucleations, Curettage, Partial Excision.)

Perineal route. 12 cases.

1-2. Billroth.[10] 1867. 2 cases. 1, aged 30. Lateral perineal incision "removal of very soft tumor size of a duck's egg." Recurrence two months. Death 14 months. 2, aged 56. Irregular middle lobe. Median perineal incision. Curettage of middle lobe. Death 4 days. Peritonitis.

3. Harrison.[12] 1882. 1 case, aged 64. Median perineal enucleation, small middle lobe. Recurrence. Death 14 months.

4. Heath.[13] 1887. Perineal route, partial excision. Death 30 days.

5. Adenot.[14] 1901. 1 case, aged 56. Perineal enucleation of prostate, urethra and capsule not excised. Recurrence.

6. Greene.[15] 1903. 1 case, aged 59. Enucleation of prostatic lobes. Recovery from operation not followed.

7-10. Pousson.[5] 1904. Albarran's operation. Enucleation of prostatic lobes, leaving capsule and urethra in all 4 cases.

Results.—

Case I, 57 years, followed three months, apparently well.

Case II, 54 years (also curettement of neck and bladder). Recurrence and death 5 months.

Case III, 62 years, nine months later patient apparently well.

Case IV, 66 years, recurrence and death 9 months later.

11. Young, 1903. (Case VI.) Patient aged 75. Duration 3 years. Pain 18 months. Hard prostate. Diagnosis: Benign sclerotic hypertrophy. Perineal enucleation. Recurrence. Urinary obstruction. Bottini operation. Partial relief. Death one year later. No autopsy.

Suprapubic route. 9 cases.

1. Belfield.[16] 1888. 1 case, aged 48. Villous outgrowth from left lateral lobe removed by forceps, curette and cautery. Recurrence 2 months. Death 5 months.

2. Czerny. (Stein.[17]) 1889. 1 case, aged 42. Partial removal with curette and cautery. Not followed.

3. Parona.[18] 1891. 1 case. Excision middle lobe. Recurrence and death later.

4-5. von Frisch.[19] 1898. 2 cases. Excision of middle lobe, "fully cured and well one year after operation."

6-7. Harrison.[20] 1903. 2 cases. 1, aged 64. "Piecemeal excision." Recurrence. Death 4 months. 2, aged 61. Recurrence 16 months later.

8. Jacobson.[21] 1901. 1 case, aged 61. Frequency of urination and intermittent hematuria one year. Prostate large, hard, and nodular, adherent to rectum. Operation.—Suprapubic prostatectomy. Enucleation of lateral lobes. Result.—Ulceration into the rectum. Death at the end of six months from recurrence.

9. Young. 1901. (Case II.) 1 case, aged 67. Indurated prostate, large vesical calculus. Suprapubic prostatectomy. Three and a half years later extensive retroperitoneal metastases.

RADICAL OPERATIONS. (PROSTATE, CAPSULE, AND URETHRA AT LEAST REMOVED.)

A. Complete excision of Prostate, the entire bladder and the seminal vesicles. Transplantation of ureters into rectum. 1 case.

Küster.[22] 1891. 1 case, aged 53. Pain, difficulty in micturition, hematuria. Prostate hard, irregular, continuous above with indurated seminal vesicles and bladder. Cystoscope showed a tumor of the posterior wall of the bladder.

Operation: Suprapubic incision, enucleation of entire bladder. Perineal incision, division of membranous urethra, separation of prostate and seminal vesicles from surrounding structures. Division of ureters just above bladder. Removal of bladder, vesicles, and prostate in one piece. Transplantation of ureters into rectum. Death five days later.

B. Complete excision of Prostate, most of the bladder, probably the seminal vesicles. Transplantation of ureters. 1 case.

Harris.[23] 1902. One case, aged 53. Hematuria and frequency of urination for one year. Prostate hard and irregular, tender. No note on seminal vesicles. Cystoscope showed a vesical tumor involving the trigone and base of bladder.

Diagnosis: Carcinoma of bladder extending into and involving the prostate.

Operation: Suprapubic incision. Transverse division of urethra in front of prostate. Removal of entire prostate, and all but the vertex of the bladder 7 cm. in diameter. Transplantation of ureters into the remaining portion of bladder. No attempt to suture the bladder to membranous urethra. Recovery. Death two months later from pneumonia. At that time patient was wearing a catheter in penis through which most of the urine escaped. Suprapubic fistula present.

Autopsy: Pneumonia, right lung. Right kidney small, interstitial nephritis. Left kidney normal. Ureters patent. Extensive new formation of bladder epithelium around catheter reaching almost to membranous urethra. Metastases in glands near aorta and kidney. Examination of specimen shows carcinoma of prostate and base of bladder.

C. Complete excision of Prostate, the seminal vesicles and adjacent portion of Bladder, leaving ureters intact. 4 cases.

Young. 1904. (Cases VII-X reported in full above.) 4 cases.

Perineal operation. Exposure of membranous urethra, incision, insertion of prostatic "tractor," transverse section of membranous urethra, separation of prostate and vesicles from surrounding structures. Incision of anterior wall of bladder 1 cm. above prostate, excision of cuff of bladder with prostate (division of trigone close to ureters). Division of vasa deferentia, removal of prostate, cuff of bladder, vesicles and vasa in one piece. Restoration of defect by anastomosis of anterior wall of bladder with membranous urethra, closure of remainder of bladder opening. Retained catheter in urethra. Partial closure of perineal wound.

Case I.—No. 15,929, aged 70 years. Duration, one year. Bottini operation (elsewhere) three months ago. Prostate large, hard, seminal vesicles involved. Recovery. Restoration of urination through urethra. Subsequent formation of vesical calculi, litholapaxy nine months after first operation. Death, sepsis. Recurrence found at autopsy.

Case II.—No. 16,675, aged 64 years. Duration, three years. Prostate hard, large, trigone involved by neoplasm, no ulceration. Both urethral papillæ excised with trigone at operation. Recovery. Death six weeks after operation from renal complications. Autopsy: No carcinoma present.

Case III.—Of. No. 829, aged 65 years. Duration of symptoms, four years. Lower portion of vesicles and trigone invaded. Excision complete. Closure good. Recovery. Restoration of urination through urethra, closure of fistula. Well thirteen months after operation.

Case IV.—Of. No. 930, aged 64 years. Duration of symptoms, one year. Prostate large, tender, hard left lateral lobe, seminal vesicle and lymphatic gland involved, right lobe and vesicle soft. Trigone involved near prostate. Excision complete, with one involved pelvic gland. Closure satisfactory. Recovery. Perineal wound closed. Discharged five weeks later apparently well.

D. Excision of Prostate without Seminal vesicles. 3 cases.

1. Leisrink.[21] 1882. 1 case, aged 64, who had suffered with a dull aching pain in the rectum for 18 months. No pain or difficulty of urination. Prostate enlarged, indurated in region of both seminal vesicles.

Operation: Exposure of prostate through perineum. Excision of prostate with capsule from bladder and membranous urethra. Seminal vesicles not removed. Suture of anterior wall of bladder to membranous urethra. Death 13 days after the operation.

Autopsy showed complete removal of carcinomatous tissue—no glands involved.

2. Czerny. 1889. (Stein.[17]) 1 case, aged 47 years. Urinary obstruction 2 years. Pain in rectum nine months. Prostate hard and large.

Operation: Suprapubic cystostomy. Discovery of a large tumor of the left lobe, ulcerated and projecting into the bladder. Lithotomy position. Perineal excision of entire prostate. Seminal vesicles and floor of bladder not removed. Reunion of bladder with urethra impossible. Operative recovery. Perineal fistula. Death nine months later. No autopsy.

3. Fuller.[25] 1898. 1 case, aged 69. Frequency and difficulty of urination; hematuria. Prostate enlarged, firm, smooth, regular.

Diagnosis: Simple hypertrophy.

Operation: Suprapubic cystostomy. Discovery of intra-vesical tumor of prostate involving the adjacent anterior wall of bladder. Division of membranous urethra. Excision of prostate with small portion of anterior vesical wall. Seminal vesicles and trigone not removed. Suture impossible. Operative recovery. Restoration of normal urination. Death 11 months later from recurrence.

E. Rectum and Prostate involved by Cancer. 5 cases.

Demarquay.[26] 1873. Two cases of carcinoma of rectum involving the prostate.

I. Aged —. Excision through anus and rectum of anterior wall of rectum and adjacent indurated portions of prostate, "urethra and ejaculatory ducts respected." Recovery. Well at end of two years.

II. Aged 52. Excision through anus of anterior wall of rectum, the prostate, seminal vesicles and portion of trigone. No attempt to close bladder and rectum. Death 8 days later.

III-IV. Depage.[27] Two cases. 1. Carcinoma of rectum involving prostate. Partial excision of prostate with wall of rectum. Second operation to close recto-vesical fistula successful. Ultimate result not given. 2. Excision through rectum of a prostatic carcinoma, size of an apple which involved rectum. Death in 9 days.

V. Czerny. (Stein.[17]) 1889. 1 case, aged 65. Cancer of prostate involving rectum and seminal vesicles. Excision through perineum of prostate, portion of bladder, seminal vesicles and a portion of the anterior wall of rectum. Suture of bladder to membranous urethra with three sutures. Death 12 days after operation.

F. Sarcoma of Prostate. 3 cases.

I. Spanton.[28] 1882. 1 case, aged 70. Constant pain in rectum. No urinary trouble. Prostate size of a fœtal head. Partial removal through perineum. Death on following day.

II. Socin. (Burckhardt.[29]) 1894. 1 case, aged 50. Constipation. No urinary trouble. Tumor behind prostate soft, smooth, size of two fists. Enucleation in toto through anus and rectum. Urethra not injured, seminal vesicles not seen. Suture of rectum and anus. Patient showed no recurrence for over three years. Death from recurrence 4 years after operation.

III. Verhoogen.[30] 1898. 1 case, aged 53. Pain in ano-rectal region. No urinary trouble. Large spherical tumor in front of rectum and beneath skin. Operation through perineum. Division of membranous urethra. Seminal vesicles not removed. Recovery. Perineal fistula. Recurrence. Death 9 months later.

Remarks.—A study of these cases shows conclusively that partial operations are of no permanent utility in cancer of the prostate. Among the eleven cases attacked by enucleation, excision of a median lobe, or curettement through the perineum 8 died of recurrence, and the other three cases were only followed 1, 3, and 9 months respectively. The patient who had lived 9 months was reported well by Pousson, but one of my cases with large retroperitoneal, and liver metastases, still feels absolutely well as far as the pelvic organs are concerned now 3½ years after prostatectomy.

Those operated upon by the suprapubic route were 9. 5 are reported to have died of a recurrence, one has a recurrence but is still alive, one was not followed, and two were "fully cured one year after operation" (although only a median lobe was removed in each case), an utterly improbable result.

In the three cases in which the prostate was completely excised, but the seminal vesicles and the adjacent portion of the vesical trigone were not removed, death resulted in all three cases, once from operation, twice from recurrence.

Küster's case associated with multiple vesical tumors cannot rightly be included in the results of operations upon the cancerous prostate. His operation of complete excision of the bladder and prostate, with transplantation of the ureters into the rectum ended in death in 5 days. When the disease has spread beyond a localized invasion of the bladder adjacent to the prostate, radical operation is out of the question, and

such procedures as that of Küster are useless if not always certainly fatal. Those in which the rectum is invaded in the prostatic tumor are in the same category—useless and harmful. Of the five cases reported only one was cured and in this case the carcinoma started in the rectum and involved the prostate only superficially. Harris' case is very interesting, but simply shows the truth of the above statements.

Sarcoma of the prostate being an entirely different disease, and absolutely unlike in its method of growth and regional invasion should not be considered in the same class with carcinoma, and I cannot understand why Pousson, Oraison, and others have included such cases in their study of the operative results upon cancer of the prostate. Cases of cancer of the rectum should be excluded for the same reasons.

The remaining class—those in which the seminal vesicles and cuff of the bladder were excised in one piece with the prostate, comprises only the four cases of the writer. There has been no operative mortality. One case, VIII, died six weeks after the operation as a result of an operative mistake—excision of the lower half of the intramural course of the ureters along with the trigone because it felt like it was invaded. Careful study of the specimen removed, however, showed that this was a mistake; that the trigone was only invaded near the prostatic orifice, and that the excision had been much more extensive than necessary. This was fully confirmed at autopsy as careful search failed to reveal any carcinoma, regional or glandular, and sections of structures adjacent to the prostate were negative microscopically. This case would probably have been cured by the operation, had the valvular ends of the ureters not been removed.

Case VII died one year later as a result of litholapaxy. The operative specimen in this case showed cancer up to the upper limit of excision (above the left seminal vesicle) and the autopsy showed a very small area of carcinoma behind the bladder above this point. No invaded glands and no other evidence of cancer was to be found. The case had been subjected to a Bottini operation in another city three months before. A radical operation at that time would probably have cured him.

The other two cases have been operated on 12 and 13 months respectively—too recently for consideration as to ultimate results. Both are in excellent condition, however. It has been surprising to see how

easily this deep and extensive operation can be carried out and particularly how little post-operative shock and discomfort are caused.

Early Diagnosis.—The question of cure depends largely upon early diagnosis. As shown above, this is often difficult, because of the absence of characteristic symptoms and signs. When severe pain and hematuria are associated with a very hard prostate with upward prolongation of the induration into the region of the seminal vesicles on each side the nature of the disease is evident at once. When, however, the symptoms are those of ordinary hypertrophy and the seminal vesicles and intervesicular region is normal in feel the diagnosis is often difficult. After a careful review of my cases I now feel that a markedly indurated prostate causing obstruction to urination in a man over 50 years of age should be viewed with suspicion. If it is of stony hardness, it is very apt to be cancerous, especially if the cystoscope shows little or no enlargement intravesically as in the ordinary hypertrophy. In such cases I proceed to expose the posterior surface of the prostate as in the ordinary prostatectomy operations, palpate the prostate directly and if I find the posterior capsule more adherent to the rectum, the tissues more hemorrhagic and the consistence of the prostate much more indurated than in the simple hypertrophy, I generally am able to make the diagnosis of carcinoma without cutting into it, and proceed at once with the radical operation.

In a recent case after exposing the prostate I was still uncertain as to malignancy, and therefore made a longitudinal incision into the prostate on each side of the urethra as for the usual prostatic enucleation, and then excised a slice of the lateral lobe parallel to the cut. Macroscopic examination of this showed the characteristic appearance of prostatic carcinoma—granular yellowish dots and lines in a paler, more fibrous stroma, and a frozen section made at once and stained showed definite adenocarcinoma invading the intra-glandular stroma. It only required 6 minutes to make and stain the frozen section, and I therefore propose the method as one of practical utility in all cases where the operator is in doubt as to the character of the enlargement. When the presence of cancer is demonstrated the capsular incisions are to be closed at once and the radical operation carried out.

In view of the five cases detailed at the beginning of this paper in which a mistaken diagnosis was made I propose in all cases in the future to study the cut surface of the prostatic lobes immediately after their enucleation at the operating table and if there is the slightest

suspicion of malignancy to have frozen sections prepared at once. In very few cases will the wait of 5 minutes or more make any difference to the patient. In cases where the prostate is indurated, if only in part, this operating-room study of the fresh tissues is of the greatest importance. I feel sure that several of my first six cases might have been saved by the radical excision which would now follow such a course.

Conclusions.

The following conclusions may be drawn from this study of 37 cases. Carcinoma of the prostate is more frequent than usually supposed—occurring in about 10% of the cases of prostatic enlargement. It may begin as an isolated nodule in an otherwise benign hypertrophy or a prostatic enlargement which has for many years furnished the symptoms and signs of benign hypertrophy may suddenly show signs of malignant hypertrophy.

Marked induration, if only an intra-lobar nodule in one or both lobes of the prostate in men past 50 years of age should be viewed with suspicion, especially if the cystoscope shows little intra-vesical prostatic outgrowth, and pain and tenderness are present.

The posterior surface of the prostate should be exposed as for ordinary prostatectomy, and if the operator is unable to make a positive diagnosis of malignancy, longitudinal incisions should be made on each side of the urethra (as in prostatectomy) and a piece of tissue excised for frozen sections, which can be prepared in about six minutes and examined by the operator at once. If the disease is malignant, the incisions may be cauterized and closed and the radical operation performed.

Cancer of the prostate remains for a long time within the confines of the lobes, the urethra, bladder and especially the posterior capsule of the prostate resting inviolate for a considerable period. Extra-prostatic invasion nearly always occurs first along the ejaculatory ducts into the space immediately above the prostate between the seminal vesicles and the bladder and beneath the fascia of Denonvilliers. Thence the disease gradually invades the inferior surface of the trigone and the lymphatics leading toward the lateral walls of the pelvis, but involvement of the pelvic glands occurs late and often the disease metastasises into the osseous system without first invading the glands.

Cure can be expected only by radical measures and the routine removal of the seminal vesicles, vasa deferentia and most of the vesical trigone with the entire prostate as carried out in four cases by the writer and fully described by the illustrations is shown to be necessary by the 37 cases, including 8 autopsies and 10 operations, reported above.

The four cases in which the radical operation was done demonstrate its simplicity, effectiveness and the remarkably satisfactory functional results furnished.

Bibliography.

1. Courvoisier. Das Prostatacarcinom. Inaug.-Diss. Basel, 1901.
2. Wolff. Ueber die bösartigen Geschwülste der Prostata, insbesondere über die Carcinome derselben. Deutsche Zeitschr. f. Chir., Bd. 53.
3. Socin and Burckhardt. Die Verletzungen und Krankheiten der Prostata. F. Enke, Stuttgart, 1902.
4. Albarran and Hallé. Hypertrophie et Néoplasies Epithéliales de la Prostate. Annales d. Mal. d. Org. Gén. Urin., 1900.
5. Pousson. Cure Radicale du Cancer de la Prostate. Annales d. Mal. d. Org. Gén. Urin., 1904, p. 882.
6. Hawley. Carcinoma of the prostate. Annals of Surgery, June, 1904, p. 892.
7. Julien. Contribution à l'étude clinique du cancer de la prostate. Thèse de Paris, 1895.
8. Kaufmann. Ref. Socin and Burckhardt.
9. Guyon. Carcinose prostato-pelvienne diffuse. Le Bulletin Médical, 1887, Vol. I, p. 1339.
10. Billroth. Carcinoma der Prostata. Chir. Erfahrungen, Zürich, 1860-67. Arch. f. klin. Chir., 1869, Bd. X, S. 548.
11. Fenwick. Primary malignant Disease of the prostate gland. Edinburgh Medical Journal, 1899, p. 16.
12. Harrison. Lancet, September 20, 1884.
13. Heath. Cited by Pousson.
14. Adenot. Tumeur maligne de la prostate; prostatectomie périnéale. Annales d. Mal. d. Org. Gén. Urin., 1901, p. 596.
15. Greene. Cancer of Prostate. New York Medical Journal, October 24, 1903, p. 285.

16. Belfield. A Case of Cancer of the Prostate. Journal American Med. Assoc., 1888, p. 120.
17. Stein. Archiv für Klin. Chir., 1889, Vol. 39, p. 537.
18. Parona. Gazz. Med. Lombard, 1891, p. 265.
19. von Frisch. Die Krankheiten der Prostata. Wien, 1898.
20. Harrison. British Medical Journal, July 4, 1903, p. 1.
21. Jacobson. Contributions to the Surgery of Malignant Diseases of the Prostate. Annals of Surgery, 1901, Vol. XXXIII.
22. Küster. Total Extirpation of the Prostate and Bladder. Archiv. für Klin. Chir., 1891, Bd. 42, S. 864.
23. Harris. Annals of Surgery, 1902, Vol. XXXVI, p. 509.
24. Leisrink. Arch. für Klin. Chir., 1882.
25. Fuller. Journal of Cutaneous and Genito-urinary Diseases, 1898, p. 581.
26. Demarquay. De l'Ablation partielle ou totale de l'Intestin Rectal avec Ablation Partielle ou Totale de la Prostate. Gazz. Médicale de Paris, August 28, 1873, pp. 383 and 410.
27. Depage. Cited by Verhoogen, 30.
28. Spanton. Sarcoma of the Prostate. The Lancet, 1882, Vol. 77.
29. Burckhardt. Centr. der Harn u. Sex. Org., Bd. V, 1894, S. 152.
30. Verhoogen. Centralb. für d. Krank. d. Harn u. Sex. Org., 1898, Bd. IX, S. 19

APPENDIX.

A Detailed Report of 64 Cases of Cancer of the Prostate Grouped According to the Treatment Employed.

Since the preceding article was written one year ago, many new cases of carcinoma of the prostate have appeared in our practice, and owing to the great importance of the subject, particularly as regards the early diagnosis and the treatment appropriate for both early and late cases, I have decided to publish the details of all the cases, now 64 in number.

We have not had time to make a careful analytical study as regards the history of the disease, the symptomatology, the condition and findings on admission, but a cursory review of the cases shows that the conclusions tabulated in the previous article are in the main entirely correct and apply with fair accuracy to the 64 cases herein reported.

These additional cases have strengthened our confidence in the possibility of making early diagnosis of carcinoma of the prostate, and of curing these cases permanently by a very thorough radical operation as described in the preceding paper. Unfortunately no sufficiently early cases have presented themselves, but further study of the pathology and the results obtained in Cases 3 and 4, confirm our opinion as to the possibility of completely eradicating the disease if the technique described above is followed.

In the present report of cases in detail, grouping as regards the treatment employed has been followed.

A. Six cases in which the operation of radical excision was employed.
B. Eight cases in which partial perineal prostatectomy was used....
C. Two cases in which suprapubic prostatectomy was used.....
D. Seven cases in which the Bottini operation was used.....
E. Two cases in which castration was performed.....
F. Five cases in which suprapubic cystotomy for drainage was employed .....
G. Two cases in which perineal drainage was employed.....
H. Sixteen cases treated by catheterization.....
I. Eighteen cases in which the catheter was not used.....

A. The Radical Operation. Six Cases.

In six cases the radical operation described in another portion of this volume was performed. Four of these cases have been described in detail in the paper referred to, and will not be given here. These cases were:

Case 1 (see previous paper, Case VII).—Carcinoma of prostate involving the bases of the seminal vesicles. Radical excision of prostate, vesicles, vasa deferentia and cuff of bladder. Anastomosis of anterior wall of bladder and urethra. Recovery. Closure of perineal fistula, satisfactory urination through anterior urethra with no incontinence at night. Constant dribbling during the day. Painful urination coming on five months after the operation. Examination at the end of nine months showed three vesical calculi. Litholapaxy performed. This was followed by perineal and prevesical abscess, septicemia and death.

Autopsy showed only a minute area of carcinoma in the pelvis.

Case 2 (see Case VIII).—Carcinoma of prostate involving the seminal vesicle. Radical operation. Recovery. Death seven weeks later from uremia.

Autopsy showed double ureteritis and pyelitis, chronic diffuse nephritis, cardiac hypertrophy and dilatation, chronic myocarditis, endocarditis and

emphysema of the lungs. Careful examination failed to reveal any remaining carcinoma. The operation had been successful in removing all malignant disease.

Case 3.—Cancer of prostate involving seminal vesicles and anterior portion of trigone. Recovery. Restoration of urination through anterior urethra. Well eleven months after the operation (see Case IX).

Case 4.—Carcinoma of prostrate and seminal vesicles. Radical operation. Recovery. Restoration of urination through urethra. Well one year after operation (see case X).

Since the four cases mentioned above were reported the radical operation has been done in two cases. In the first case the bladder and the upper portions of the seminal vesicles were thought to be free from disease, and a hopeful prognosis was given and operation therefore attempted. The patient died of shock and autopsy showed extensive involvement of the peritoneum and the retroperitoneal lymph glands. The malignant disease of these structures had not been suspected, and was evidently the cause of the markedly lowered vitality of the patient, and death from shock of operation, as in none of the other cases was there more than slight shock after operation.

In the second case the anterior portion of the left lateral lobe presented a peculiar, markedly indurated lobule, which on section at operation showed the typical appearance of carcinoma. No freezing microtome was at hand (the operation being performed elsewhere than at the Johns Hopkins Hospital), and although the rest of the prostate looked benign, after consultation with other surgeons present, it was thought best to perform the radical operation. Subsequent microscopic examination of the specimen showed a hemorrhagic prostatitis in the suspicious area, and although a few places suggest malignancy it seems probable that the process is benign. The patient is in good condition and is comfortable, but suffers from incontinence of urine (much to my distress).

These two cases are as follows:

Case 5.—*Carcinoma of prostate and seminal vesicles. Urinary symptoms for eight months. Radical operation. Death from shock. Autopsy showed extensive intraperitoneal and glandular metastases.*

No. 1052. M. G., age 75, widowed, admitted September 25, 1905.

Complaint.—"Frequent urination."

No history of gonorrhœa. One year ago patient began to have pain in the right side just below the costal margin and radiating from there beneath the ribs to the back. A little later a similar pain appeared on the left side.

About eight months ago he first began to get up at night to urinate, but after that urination became rapidly more frequent and difficult and after a few weeks he was voiding four or four times during the night. During the past six months urination has been extremely difficult, but he has had no pain in the region of the bladder or rectum until a month ago when he began to have a severe burning during urination and particularly at the end. He has also had a severe pain in the lumbar region on both sides, and for two days has had pain in the left thigh and knee. He has had no pain in the hips, rectum, testicles or groins. During the past three weeks he has lost 16 pounds and become very weak. He has not had complete retention, no hematuria, nor gravel.

Status præsens.—Micturition every 20 minutes to one hour, not very difficult, but the stream is small and he has to strain and there is often dribbling at the end. Burning pain in the urethra, worse at the end of urination. Pain in the lumbar region on both sides, and in left thigh and knee.

Sexual powers.—Sexual desire and erections have been absent for two years.

Examination.—The patient is a sturdy looking man with mucous membranes of good color. The heart and lungs are negative. The abdomen is negative. Glands are palpable in both inguinal regions and a complete right inguinal hernia is present.

Genitalia.—The left epididymis is slightly indurated.

Rectal.—The prostate is equilaterally enlarged to a moderate degree. It is hard, but slightly elastic and not stony. The right seminal vesicle is not enlarged nor indurated. The left vesicle is also negative, but the left lobe of the prostate extends further up and the induration may involve the lower portion of the seminal vesicle. Above the prostate between the seminal vesicles the tissues are firm, and on the right side several hard cords can be felt along the pelvic wall. No enlarged glands can be felt. The rectal mucosa is soft and not adherent.

Cystoscopic.—A coudè catheter cannot be introduced owing to obstruction at the apex of the prostate. A silver catheter passes with ease and withdraws 80 cc. residual urine. The bladder capacity is 360 cc. Study of the prostatic orifice shows an irregular enlargement all around the urethra, the projection from the left lateral lobe being more irregular than the right and distinctly fissured, but covered with smooth mucous membrane. The median portion was moderately enlarged, and extending upward and to the left from it is an elevation of the trigone continuous with the median prostatic bar and also presenting an irregular somewhat nodular surface, this extends outward as far as the usual location for the left ureteral orifice which cannot be seen. The right ureteral orifice is situated in a normal ridge and is normal in appearance. The bladder is moderately trabeculated and inflamed. No ulceration, no calculus, no polypoid intravesical neoplasm present. With finger in rectum and cystoscope in urethra it is impossible to feel the beak, owing to induration beneath the trigone,

and the median and suburethral portions of the prostate are considerably increased.

Urinalysis.—Clear, acid, 1018, albumin in small amount, no sugar, no shreds, microscopically negative.

Remark.—The induration on prostatic examination at once suggested malignancy. The elevation of the trigone seen with the cystoscope by growth continuous with the median prostatic enlargement is at once confirmatory of carcinoma. The left ureteral orifice cannot be seen and the disease is evidently close to it. Owing to absence of induration in the region of the seminal vesicles, the absence of pelvic glands, the radical operation was thought to be advisable.

Operation October 13, 1905.—Ether. Radical operation for the cure of cancer of the prostate. Excision of the prostate with its capsule and urethra intact, a portion of the membranous urethra, a cuff of the bladder, nearly all of the trigone including 5 mm. of the left ureter, the seminal vesicles and about 5 cm. of the vasa deferentia, all in one piece. Anastamosis of the bladder to the membranous urethra, a complete closure of the vesical opening. The technique followed was that described in the *Johns Hopkins Bulletin* for October, 1905. The incisions were very little larger than cases of perineal prostatectomy for benign hypertrophy, and the levator ani muscles were not divided. The perineal fissures were found to be very hyperemic and there was considerable hemorrhage before reaching the prostate. The separation of the rectum from the prostate was difficult owing to adhesions. Examination of the posterior surface of the prostate revealed considerable induration with irregularity of surface, making the diagnosis positive. There was no evidence of extension of the disease beyond the capsule and the upper portions of the seminal vesicles seemed to be healthy, the radical operation was therefore begun. On exposing the trigone the mucous membrane was found reduplicated and elevated in a mass continuous with the median portion of the prostate, and extending out to the orifice of the right ureter as described in the cystoscopic examination. The interureteral bar formed a prominent transverse ridge behind which there was a fairly deep pouch, the mucous membrance, however, was everywhere soft and normal in appearance. The line of incision was carried across the trigone just below the right ureteral orifice above the ligamentum interuretericum and just above the rounded elevation described above in the region of the left ureteral orifice. Later examination showed that about 5 mm. of the left ureter had been excised, the orifice being in the upper end of the elevation of mucous membrance. The upper end of the left seminal vesicle was very adherent to the perineum and in freeing it a portion of the latter was removed, examination showed that it was thickened, rough and evidently involved. No enlarged glands or indurated lymphatics were found in the pelvis, and the bladder was perfectly healthy above the point of excision. No difficulty was experienced in anastomosing the vesical opening with the membranous urethra, and the bladder was closed with

ease with alternating sutures of catgut and silkworm gut. The wound was closed as usual. The patient lost more blood than is usual and at the end of operation his condition was reported bad, the volume of the pulse was weak, 125 to the minute. Respiration was more alarming than the pulse. He had been infused early in the operation, but only 500 cc. had been introduced. Towards the end of the operation he was transfused about 700 cc. of salt solution being introduced into one of the veins, this was followed by distinct improvement in the pulse, but the respiration remained bad and in a short time artificial respiration was resorted to. Various stimulants were used but despite these measures the patient grew weaker and died about two hours after the operation.

Pathological examination.—The specimen, G. U. 192, consists of the entire prostate, both seminal vesicles, the lower end of the vas deferens on each side, cuff of the bladder, and prostatic urethra. On the left seminal vesicle there is a small piece of peritoneum attached which shows little yellow dots suggesting metastases. The middle lobe is not much enlarged and the prostatic urethra at its opening appears dilated. Serial gross sections of the prostate show a half moon shaped zone of prostatic tissue which has the typical naked eye appearance of carcinoma, and situated towards the posterior surface of the prostate. The anterior portion of the lobes has the appearance of benign hypertrophy. Towards the upper end of the prostate the carcinoma area broadens and then travels upwards into the region of the seminal vesicles and involving both. The median portion of the prostate, which is small, seems apparently not involved. At autopsy it was found that direct extension of the disease from the left peritoneal cavity had occurred, and there were extensive metastases in the pelvic and retroperitoneal glands as far up as the bifurcation of the aorta.

Microscopical examination.—The sections from the anterior portion of the lateral lobes show a benign adenomatous hypertrophy. Section from the prostate in the area which showed carcinoma with the naked eye shows an adenocarcinoma, within most places a rather large amount of stroma. The acini are often grouped together, are usually very small and lined by an epithelium showing the characteristic involution changes. In places the carcinoma is of a distinctly infiltrating type, the stroma being largely obscured by the epithelial invasion. Sections from the middle of the seminal vesicles show carcinoma of the same type invading the walls and infiltrating the surrounding tissue. There is more stroma, however, than in sections from the prostate. A section from the middle lobe which on naked eye examination was thought not to contain carcinoma, on microscopic examination shows a definite adenocarcinoma in which the acinous type is extremely well preserved.

Diagnosis.—Adenocarcinoma becoming infiltrating, with extensive involvement of the vesicles and direct extension to the peritoneal cavity from the left seminal vesicle metastatic pelvic and retroperitoneal glands.

CASE 6.—*Considerable enlargement of prostate with large indurated lobule projecting from right lateral lobe. Clinical diagnosis benign. At operation tissue removed strongly suggested cancer and as freezing microtome was not at hand a radical operation was done.*

No. 1126. G. W. F., aged 67, widowed, admitted December 28, 1905.

Complaint.—" Frequency and difficulty of urination."

No history of gonorrhœa.

Twelve years ago the patient had an attack of irritability of the bladder with very frequent urination. Examination of the prostate showed slight enlargement, and a diagnosis of prostatitis was made. After three weeks he was perfectly well, and remained so until seven years ago, when he began to have slight difficulty in urination and had to get up once or twice at night to urinate. Since then urination has gradually become more frequent and difficult, and during the past year he has had to arise four or five times every night, but has not had complete retention. During the past six weeks his symptoms have been worse; urination being very difficult and frequent. He has had no severe pain, but when the bladder becomes full he has an imperative desire to urinate and considerable discomfort, and unless he voids at once there is usually an involuntary escape of urine. He gets up about six times at night and voids about every hour during the day. There has been no pain in rectum, hips, thighs or perineum. He has not lost weight.

Sexual powers.—No note made. No hematuria.

Examination.—The patient is a sturdy-looking man with lips of good color. No arteriosclerosis. Pulse regular and of good volume.

Genitalia.—Negative.

Rectal.—The prostate is considerably hypertrophied, forming a round mass about the size of a medium sized orange. The surface is smooth and regular with the exception of the anterior portion of the right lateral lobe, from which there is a round projection about the size of a cherry and distinctly firmer than the rest of the prostrate, but not markedly indurated. The prostatic capsule is smooth and the consistence is generally elastic, in places soft. The seminal vesicles are apparently not enlarged nor indurated. The prostrate is not tender. No enlarged glands are to be felt. The rectum is soft and not adherent. The prostatic secretion contains very few pus cells, a few granule cells, and is mostly composed of spermatozoa, some of which are motile.

Urinalysis.—Acid, 1022, no albumin, no sugar. Microscopically negative.

Cystoscopic.—A coudè catheter could not be passed owing to obstruction in the region of the middle lobe. A silver catheter passed, but produced some hemorrhage. Considerable amount of residual urine is found present, record of amount lost. An attempt was made to pass a cystoscope, but without success, owing to obstruction in the median portion of the prostate.

Note.—The general character of the prostate was that of a benign adenomatous hypertrophy. The indurated nodule in the anterior portion

of the right lobe made us suspicious of carcinoma, and it was very unfortunate that no cystoscopic examination could be made on account of its diagnostic value.

Operation December 29, 1905.—Ether. The prostate was exposed through the usual technique, and the tractor was inserted with ease. The rectum was fairly adherent but was finally separated from posterior surface of the capsule, leaving a smooth white surface. Examination of the prostate showed a prominent rounded lobule projecting from the left lateral lobe in its anterior portion which was covered with smooth mucous membrane, but was distinctly harder than the rest of the prostate. Bilateral capsular incisions were made as for the usual prostatectomy. The cut surface on the left side presented no unusual aspect. On the right side the cut surface showed small irregular areas of hemorrhage in a hard stroma with small grayish dots and lines, granular in appearance studding the surface. The sensation to the knife in making the incision was much firmer and rougher than usual. The picture described above was sharply circumscribed and confined to an area about 2 cm. long and 1½ cm. deep. Beyond this the cut surface presented the usual appearance of a benign hypertrophy. As no freezing microtome was at hand the operator decided to excise this portion of the right lateral lobe with its capsule. Examination of the suspicious portion by means of further incisions in the tissue while not positively characteristic of carcinoma was so very suspicious that it was thought advisable to do as radical an operation as possible on the provisional diagnosis of carcinoma. The operator then excised all the lateral lobes of the prostate with the capsule, the floor and most of the lateral walls of the urethra. The lower portion of the right seminal vesicle was removed with this mass, an examination of the tissue between it and the deeper portion of the right lateral lobe, showing that it was quite hard and very suspicious of carcinoma on section. It was therefore thought advisable to remove still more tissue. An irregular area of vesical neck including most of the trigone was then excised, more difficulty being experienced than in the typical operation for carcinoma, owing to the fact that the traction was imperfect, the bladder being caught by forceps in various places. The upper portion of the left seminal vesicle was not excised. The right seminal vesicle was removed in two pieces along with the vas deferens. Examination of the upper limits of the tissue removed showed no suggestion of malignancy. The anterior portion of the prostatic capsule and the roof of the urethra attached to it were left intact. The operator hoped that this would be of assistance in closing the vesical wound, but it proved to be a hindrance, and the vesical urethral anastomosis was much more difficult to accomplish. It was finally possible, however, to draw down the lateral walls of the bladder and suture them to the membranous urethra and to each other in the median line posteriorly, thus completely closing the vesical wound. Interrupted catgut and silkworm gut sutures were used, the latter being left uncut so that the ends of the sutures

projected from the wound for future removal. After packing the retrovesical cavity lightly with gauze and drawing the levators together with single sutures of catgut, the skin wound was closed partially with interrupted sutures of catgut. The urethra was drained with a large rubber catheter which was held in place with adhesive plaster.

Convalescence.—The patient reacted well, and his pulse did not rise above 76 during the night after the operation. He was infused on the table and again at 8 p. m. The catheters were removed from the urethra on the seventh day, and after that urine began to come through the perineal wound for the first time. He was put in a wheel-chair on the seventh day and walking about the ward on the tenth day. The rectal sphincter was weak, and the perineal fistula was very slow in healing. The temperature arose occasionally in the evening; on January 3 and 4 it rose to 101.5°, after that it was normal until January 11, but then for a week had a daily rise of temperature occasionally reaching 102°. The The fistula closed on February 13, but the temperature rose to 102.8°., and after two days the fistula opened again, pus was discharged and the temperature fell to normal. The perineal fistula closed finally on February 25, 58 days after the operation, but he continued to have slight elevation of temperature in the evening.

March 8, 1906.—The perineal fistula has remained closed since February 25. He is able to retain urine for 1½ hours when sitting quietly, when walking about small amounts of urine escape at intervals. He has no pain in bladder, urethra, rectum or region of the kidneys. The urine is acid, sp. gr. 1012, there is a small amount of albumin. Microscopically pus and epithelial cells, bacilli and cocci.

May 29, 1906.—Letter from physician. "The patient's general condition is very good and he is able to attend to his duties. He has no control over his urine, but there is no flow during the night. After arising in the morning there is a frequent discharge of urine during the first hour."

Pathological examination.—The specimen G. U. 224, consists of six pieces of prostatic tissue, the prostatic urethra middle lobe and adjoining parts of the lateral lobe together with the lower end of the right seminal vesicle form one piece. The left lateral was removed in one piece and the right in two. Two of the pieces consist of bladder with portions of the vasa and vesicles attached. On the posterior surface of the right lateral lobe just beneath the capsule there is a firm tissue which on section is granular and hemorrhagic. It extends from the periphery inwards about 1 or 2 cm. This portion of tissue was considered suggestive of carcinoma at operation, but when the specimen was examined, 24 hours later, the appearance of the above described area was considerably changed and did not suggest carcinoma nearly so strongly, rather suggesting prostatitis limited to the peripheral portion of the glands. The deeper portion of the gland is lobulated, apparently largely glandular with numerous small cysts and dilated acini. The left lateral lobe about its periphery presents the same appearance as the right lateral, consisting of a layer

of tissue which is firm, somewhat granular looking, and probably largely fibrous tissue with small hemorrhagic areas here and there. Numerous small pin-point sized prostatic calculi seen. The deep portion of the gland is lobulated and has the same appearance as the deeper portion of the right lateral. The seminal vesicles are soft and seem normal.

Microscopical examination.—The hypertrophy is for the most part an adenomatous one with some areas where the fibro-muscular element predominates. The glandular tissue is largely arranged in spheroidal lobules, the acini showing the usual characteristic appearance. Within the area considered suggestive of carcinoma, clinically, there is found a rather excessive amount of fibro-muscular tissue with considerable chronic prostatitis. Throughout other portions of the gland there are here and there small areas of prostatitis. The hypertrophy is a glandular one with formation of spherical lobules and comparatively small amount of stroma which contains more fibrous tissue than muscular. Sections from the lower end of the seminal vesicle show them to be apparently normal. No evidence of carcinoma in any part of the prostate. The prostatitis is almost entirely limited to the condensed peripheral portion of the gland. The central hypertrophied portion showing only a few minute areas of mild prostatitis.

B. Conservative Perineal Prostatectomy. Eight Cases.

In eight cases the technique employed in the removal of benign prostatic enlargements through the perineum and described in another portion of this volume, has been employed (with the exception of one case in which the Alexander operation, perineal prostatectomy with the aid of a preliminary suprapubic cystotomy, was performed).

In only one of these cases was the positive diagnosis of carcinoma made before operation (Case 13), the operation being performed with the hope of relieving obstruction and doing away with the necessity of catheterization which could not be carried out by the patient.

In Cases 10, 11 and 12, examination of the tissues at operation suggested malignancy, but the operator was not prepared to perform a radical operation in one case and the other two cases were too old and weak. In the other four cases carcinoma was not suspected at operation.

All of these cases with the exception of Case 14, have been operated on by the writer. Among these eight cases there has been one death following the operation (Case 13). Two cases have died since the operation, both having suffered considerable pain and retention of urine after operation (Cases 7 and 8). In one case (Case 9), there has been a recurrence of the obstruction and residual urine, but the patient is comfortable and voids urine with ease.

The results obtained in these cases have been surprisingly good, and makes one wonder whether it would not be advisable in many cases of carcinoma of the prostate, where the radical operation is out of the question, and catheterization difficult or painful, to perform conservative perineal prostatectomy to relieve the obstruction rather than suprapubic drainage. The excellent results obtained in four cases would seem to indicate this.

These cases are as follows:

CASE 7.—*Carcinoma of prostate and seminal vesicles. Duration three years. Frequency of urination, catheterism. Perineal prostatectomy. Death 19 months later.*

No. 227. T. R., age 66, married, admitted August 9, 1898.

Complaint.—"Retention of urine, catheterism."

The patient had had gonorrhœa at the age of 25 years, and seven years ago a second attack characterized by marked frequency of urination, tenesmus and epididymitis. The present illness began three years ago with difficulty and frequency of urination, which gradually increased. Five months ago he was voiding urine about five times every night. He consulted a physician who used a catheter, and since then catheterization has been necessary, voluntary urination being impossible. For four months the patient catheterized himself very frequently and he now draws his urine every two hours.

Pain.—No note made.

Examination.—The patient is emaciated and weak. The heart and lungs are negative. Abdomen and genitalia, not noted.

Rectal.—The prostate is greatly enlarged, about the size of a small orange. It is rough, nodular, and very hard. The right lobe is larger than the left and presents one very large hard prominent nodule which passes toward the rectum. The induration extends upwards towards the region of the seminal vesicles and it is difficult to reach the upper end of the prostate with the finger.

The diagnosis of cancer or a very fibrous prostate was made.

Urinalysis.—Cloudy, acid, albumin, pus cells.

Operation, August 17, 1898.—Perineal prostatectomy with preliminary suprapubic cystotomy (Alexander's operation). The bladder was opened above the pubes for examination and assistance in pushing down the prostate during perineal prostatectomy. Examination showed no median lobe hypertrophy. The urethral orifice was patent, but although the prostatic lobes did not project into the bladder the prostate pushed the anterior wall towards the bladder cavity and there was a bas-fond behind it. Perineal prostatectomy was performed with the patient in the lithotomy position, through an incision which started in the median line and extended to the right side of the anus. The levator ani muscles were separated and the base of the prostate exposed. It was hard, nodular, and the

induration extended into the right seminal vesicle which was enlarged and closely adherent to the upper end of the prostate. The prostatic lobes were divided on each side parallel to the urethra which contained a catheter and leaving a block of tissue adjacent to the urethra. The tissue was so hard that it was necessary to use the scissors, and gave the impression of scirrhous cancer. The right seminal vesicle was excised partially with the right lateral lobe. A small tear was made in the prostatic urethra. The wound was packed with gauze and the bladder was drained through a catheter, and the suprapubic wound was closed. The patient was considerably shocked by the operation and received two infusions.

Convalescence.—The patient reacted fairly well, the gauze pack was removed at the end of 24 hours and the urethral catheter on the fifth day. The suprapubic suture of the bladder did not leak, and the gauze was removed from the prevesical space on the 13th day. The patient did not require catheterization after the operation, but urination was quite frequent. On September 25, a catheter found 30 cc. residual urine and a bladder capacity of 130 cc. On December 17, the patient was discharged from the hospital. A catheter showed 50 cc. residual urine and a bladder capacity of 300 cc. There was a small perineal fistula, but the patient was able to void naturally through the urethra and did not use the catheter.

August 5, 1899.—Letter. The patient reports that he is unimproved and that he has to use the catheter regularly as before operation.

January 8, 1902.—Letter from wife. "My husband continued to use the catheter and suffered a great deal of pain. The perineal fistula never healed, and later a very large open sore appeared. A few weeks before he died the bladder ruptured into the bowel, and the urine came away with the stools. He became very drowsy and died March 6, 1900."

Pathological report.—The specimen consists of the prostate gland removed in fragments. Of these one contains a patent canal—perhaps a seminal vesicle. The glandular portion is excessively hard, firm, and resistant to pressure, and cuts with a peculiar sound of fibrous tissue. There can be no stripping of capsule. The glandular tissue seeming intimately associated with surrounding structures. On section the tissue is translucent, but not homogeneous as lines and dote can be made out. There is nothing expressed on pressure, but a clear serous fluid. The line of demarkation between the glandular portion and the surrounding hemorrhagic area is sharp, but no separation can be made by dissection. The portion containing the duct or canal, shows this structure as what appears to be the posterior edge of the prostate.

Microscopic examination.—The tissue is that of an adenocarcinoma with a large amount of stroma. The acini show a great deal of intraacinous proliferation which at times results in the formation of small alveoli filled with new formed acini and containing comparatively no stroma. Here and there the epithelium which shows involution changes characteristic

of carcinoma is breaking through these alveolar walls, and infiltrating the surrounding stroma.

This carcinoma might be termed a tubular form of adenocarcinoma.

CASE 9.—*Moderate enlargement of the lateral lobes. Suprapubic cystostomy six months previously. Perineal prostatectomy. Imperfect result. Restoration of natural urination, but considerable residuum present. Small area of cancer discovered microscopically.*

No. 463. J. T. Y., age 60, married, admitted September 24, 1903.

Complaint.—" Prostatic obstruction. Suprapubic urinary fistula."

Gonorrhœa in 1882, was cured without complication.

Present illness began two years ago with frequency of urination. The course of the disease was characterized by difficulty of urination, gradual increasing frequency, pain near the end of the penis before and during urination. No hematuria.

In October, 1902, he had typhoid fever and had to be catheterized for some time. During the spring of 1903, urination was very frequent and difficult, and his physician performed suprapubic cystostomy.

S. P.—The patient is wearing a Bloodgood bag. He suffers considerably from pain in the bladder. Is unable to void urine.

Sexual powers.—Good.

Examination.—The patient is a strong looking man with lips and mucous membrane of good color. Chest is negative. A suprapubic fistula is present in which the patient wears a tube connected with a Bloodgood bag.

Rectal.—The prostate is considerably enlarged, smooth, rather hard in consistence. The median furrow is shallow, but the notch is quite deep. The seminal vesicles cannot be palpated, but the lateral lobes extend upward and outward into the region of the vesicles and are quite closely adherent to the pelvic walls.

Cystoscopic.—The cystoscope is introduced through the suprapubic wound, and shows two fairly large intravesical lateral lobes with a deep sulcus anteriorly and posteriorly and a greatly flattened urethra between them. Posteriorly there is a very slight median bar of mucous membrane which connects the two lobes. Another cystoscope was inserted through the urethra and showed the same as the suprapubic cystoscope (see detailed description in article on cystoscopy of the prostate, Case II). With finger in rectum and cystoscope in urethra there is very little median enlargement found.

Operation, October 4, 1903.—In Lynchburg, Va. Chloroform. Perineal prostatectomy by the usual technique. The lateral lobes were surprisingly small and were removed with difficulty owing to adhesions. At the end of the operation the lateral cavity was carefully examined with the finger and no enlargement was found. The blade of the tractor in the bladder could be easily felt with only a thin mucous membrane intervening. After the operation a finger was inserted in the suprapubic wound and no intravesical enlargement found. The wound was closed

as usual with double drainage tubes, light packs for the lateral cavities, and a large suprapubic drainage tube. He stood the operation well. Continuous irrigation was begun on return to room and his doctor was instructed to continue the irrigation for four or five days, to withdraw the perineal packing partly on the third day and completely on the fifth and to remove the perineal tubes on the seventh day.

October 12, 1903.—The patient has done beautifully and has not had an untoward symptom. The packing and perineal tubes were removed on the fifth day and since then all of the urine has come through the suprapubic opening in which he is still wearing a tube. The perineal wound is healing rapidly and there has been no leakage since the perineal tubes were removed.

December 15, 1903.—" All the wounds have healed and I urinate through the penis, but it is slow. I am improving, however, and feel infinitely better than I did before operation."

January 20, 1904.—" I void urine about every two and one-half hours during the day, but only once and sometimes twice during the night. Urination is neither easy or satisfactory, is very slow in starting, and I have to make three or four attempts in the morning before I can empty my bladder. My general health is good."

May 20, 1904.—" Yesterday I held urine from 11 a. m. to 4.30 p. m. and voided half a pint, but urination is not entirely satisfactory. I have had no erections."

February 1, 1905.—" I void urine naturally but not satisfactorily, two or three times at night, sometimes 15 times during the day, general about one-quarter of a pint at a time, sometimes not more than a tablespoonful. I have a burning sensation before urinating. My general health is good."

July 18, 1905.—The patient feels well, but generally gets up every two or three hours to urinate at night, and sometimes has considerable hesitation, at other times urine passes freely, and he may be able to retain it for five hours. He has had no erections, but two weeks ago had a profuse nocturnal emission.

Examination.—Both wounds are firmly healed.

Rectal.—In the region of the prostate is a hard cicatrix which is smaller than the ordinary prostate. Nothing resembling prostatic enlargement is to be felt and the bladder above is soft. A catheter passes with ease and finds 650 cc. residual urine. The patient had just voided 100 cc. The cystoscope shows two intravesical lobular outgrowths in the lateral lobes with a deep sulcus anteriorly and posteriorly. There is no median posterior enlargement, but a small fold of mucous membrane joins the two lateral lobes. These lateral lobules are apparently small, but come together like valves as seen by moving the cystoscope up and down. The bladder is only slightly trabeculated. There is no calculus present. With finger in rectum and cystoscope in urethra there is no increase in median portion shown.

Remark.—A study of the history of this case shows: That the intravesically projecting lateral lobes were not completely removed at operation. Urination has never been free and satisfactory as is usually the case, and the cystoscope now shows much the same picture in the bladder as before operation, and the catheter finds 650 cc. residual urine. From subsequent experience it seems evident that when traction was made with the prostatic tractor the blades slipped beneath the prominent lateral lobes, there being no median lobe present to hold up the shaft of the instrument. The lobes removed at operation were smaller than was expected. and examination now shows that these represented only that part of each lobe which presented rectally, and the intravesically projecting lobes which were above the blades of the tractor were not removed. In several cases which I have had of late this would have happened had I not been careful to engage and draw down the intravesical portion after removal of the rectally presenting portion. This was not done in this case. A second operation was advised with the view of enucleating the remaining lobule. Patient refused operation.

November 30, 1905.—Letter. "I am not cured but very much benefited. I void urine naturally but not always satisfactorily, two or three times at night and from eight to twelve times during the day, about one-quarter of a pint at a time. I suffer no pain, have not had erections. My general health is good."

Pathological examination.—The specimen, G. U. 232, consists of two lobes, the right and left lateral which have been removed each in one piece, and measure about 2 x 3 x 3 cm. in size and weigh about G. 12. The surfaces are lobulated, the consistency elastic, and on section the tissue presents the usual appearance of benign hypertrophy.

Microscopic examination.—Several sections have been made, and, with one exception, show only a benign glandular hypertrophy. The acini are dilated; there is much intraacinous budding, and the epithelium has formed rugæ with cells two or more layers deep. The stroma is slight in amount, and mostly muscle. Numerous areas of chronic prostatitis are seen. A section from this prostate presents a most interesting picture. The prostate is of a benign type apparently except in one small, somewhat spherical area of minute size (see Fig. 16). The acini within this area are small, irregular in shape, rather closely set together, and the picture immediately strikes one as being atypical. The epithelium lining these small compact acini is mostly of a cylindrical type, and usually consists of a single layer. Occasionally the small acini are lined by a rather cuboidal type of epithelium. The nuclei vary some in size, sometimes being rather small and round, at other times fairly large and irregular. Not infrequently one sees a solid tube of epithelium. The epithelium apparently at no definite point shows a definite breaking through of the acinous wall to infiltrate the surrounding stroma. Many of the acini have apparently no basement membrane, and the epithelium seems to line simply an open space. About the periphery of this small

lobule these atypical acini are infiltrating irregularly the surrounding stroma. The stroma between the acini of this nodule is rather small in amount and consists of slender interlacing bands rather loose and cellular in character. The diagnosis of malignancy within this small limited area seems warranted. The atypical acini, atypical in shape and the character of their epithelium, and the definite infiltration of the surrounding stroma seem to point definitely towards malignancy.

Case 10.—*Small indurated prostate carcinoma. No intravesical lobes. Complete retention of urine. Double kidney infection, uremia, fever. Perineal prostatectomy. Restoration of natural but somewhat frequent urination followed twenty-six months after operation.*

No. 576. D. C., age 72, admitted March 15, 1904.

Complaint.—" Complete retention of urine."

No history of gonorrhœa.

Present illness began about three years ago with difficulty and increased frequency of urination, which gradually increased. During the last four or five months the patient has had to void every half hour during the night, but there has been no pain until recently. About ten days ago he was unable to urinate and a physician attempted to catheterize him, but without success. He then began to void small amounts and was catheterized the next day, three pints of urine being evacuated. During the next week he voided urine very frequently and suffered a great deal of pain. On March 12, he was again catheterized with difficulty, 1500 cc. urine being withdrawn. He was not catheterized again until 40 hours later (although he had voided very little), and this was after admission to the Johns Hopkins Hospital. One week ago he had a severe attack of pain in the region of the left kidney radiating thence toward the bladder accompanied by vomiting and fever. This has continued up to the present time.

S. P.—The patient has complete retention of urine, great pain in the region of the bladder. His physician has been unable to catheterize him.

Sexual powers.—No note made.

Examination.—The patient is a very thin weak old man. The chest is thin and flat, expansion very poor. Both lungs clear. The heart sounds are clear, but the second aortic is accentuated. The pulse is 68, regular and of good volume, and fair tension, but the arteries are moderately sclerotic. The abdomen is distended in the lower part, and there is slight tenderness on deep palpation over the whole abdomen. In the region of the left kidney there is marked tenderness with resistance and voluntary muscle spasm preventing deep palpation. The bladder is markedly distended and very tender. Genitalia negative.

A silver catheter passes with ease and finds 500 cc. of pale clear urine.

Rectal.—The prostate is slightly enlarged, hard, smooth. The seminal vesicles are palpable and indurated.

Urinalysis.—March 15. Pale, 1005, slightly acid, no sugar, albumin a trace.

Microscopically pus cells, epithelium and bacteria.

Preliminary treatment.—March 19. The patient has been catheterized three times a day. Residual urine is about 540 cc. The patient is weak and takes his nourishment poorly. He is irrational and there is still a marked tenderness in the region of the left kidney. Temperature subnormal, to-day 96°, pulse 64.

March 20, 1904.—The patient was delirous and has had hiccoughing for 12 hours. He seems very weak. Temperature still subnormal. Infused with 850 cc. salt solution.

March 21, 1904.—Condition of patient continues bad. A retained catheter is supplied for continuous drainage. Water in abundance by mouth, rectum, and infusions.

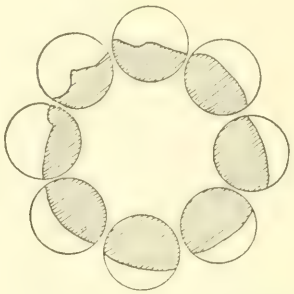


FIG. 18.—Cystoscopic chart before operation, Case No. 10.

March 31.—For several days the patient continued irrational with nausea and vomiting, pain in the region of the left kidney and definite evidence of uremia. Under continuous drainage and active hydrotherapy his condition has gradually improved. The specific gravity of the urine has increased from 1005 to 1014. The amount voided being about the same, varying from 1600 to 2400 cc. The patient is now out of bed, eats and sleeps well and is now much brighter and stronger.

Cystoscopy, April 4.—The bladder has become considerably contracted, retains very little fluid making cystoscopy difficult. The cystoscope shows a definite circular enlargement around the entire orifice as shown in the chart, Fig. 18. There are no definite lobes and no sulci, but the entire orifice is constricted by a circular ring of small size. The surface is a little irregular. The bladder is markedly inflamed, no stone present. With finger in rectum and cystoscope in urethra there is a definite increase in the median portion.

April 6, 1904.—Patient had a sudden rise of temperature to 102.8° and he became slightly irrational. The amount of urine voided is good, about 2500 cc. in amount, an infusion was given and he now seems brighter.

April 14, 1904.—During the past week there has been a fever reaching 101° daily. He is irrational at times and very weak, but is up in a wheel chair. Water is forced and occasionally he has been infused.

April 21, 1904.—For four days the patient's temperature was almost normal. During the past two days it has risen again to 101°. The general condition is weak but somewhat better than previously. The bladder has become much contracted and holds only 30 cc. The patient seems to have reached a stand still and operation is decided on as necessary to prevent a decline.

Operation, April 22, 1904.—Spinal anesthesia. Perineal prostatectomy by the usual technique. One-third of a grain of cocaine was dissolved in the spinal fluid and produced excellent anesthesia. The lateral lobes were very little larger than normal, were markedly adherent, had to be dissected free from capsule and urethra and the left was removed in two pieces. No median mass could be engaged with the tractor which was therefore removed and a finger inserted into the bladder. The entire prostatic urethra was found contracted so that it was difficult to introduce the index finger and in so doing the right lateral wall of the urethra was split open. Examination showed no remaining prostatic obstruction around the prostatic orifice which was surrounded by a fairly tight ring. After thorough dilatation of this it was not though advisable to remove the median portion of the prostate which did not seem at all enlarged. The wound was closed as usual with double tube drainage and light packs for the lateral cavities. An infusion was given at the beginning of the operation and continuous irrigation on return to the ward. The patient stood the operation well. Pulse at the end 60.

Convalescence.—The patient reacted well, but the temperature rose to 101.7° on the night after the operation and on the fourth day reached 103.3°. After one week it reached normal and remained practically so. The gauze was removed on the third day and the tubes on the fourth day. He drank water well, but was infused on the sixth day. He was out of bed during the first week and walked during the second week. Urine did not flow through the urethra until the 22d day. He had no complications after the operation and left the hospital on the 37th day. The fistula was healed (34th day), and he voided urine naturally without pain and at frequent intervals.

June 4, 1904.—The patient complains of frequency of urination, the interval being one and one-half to two hours. Silver catheter passes without meeting obstruction and finds 20 cc. residual urine. The bladder is contracted and holds only 150 cc. on forced distention. The patient is advised to drink water in abundance and to hold urine as long as possible in order to distend the bladder.

June 28, 1904.—During the past week the bladder has been dilated by hydraulic pressure once daily, the capacity is now 270 cc. Under this treatment the fistula reopened but it has now been closed for one week.

November 11, 1904.—The bladder capacity on forced distention was 240 cc. Urination easy, but frequent.

January 13, 1905.—Letter. "I void urine naturally without pain except a slight one at the beginning of urination, three or four times at night and every two hours during the day and about four ounces at a time. My general health is fairly good."

November 30, 1905.—Letter. "I void urine naturally three or four times during the night and every two hours during the day, four or five ounces at a time. The wound has remained healed. I suffer very little pain. Do not have erections. My general health is fairly good. I have gained in weight and consider myself cured."

May 12, 1906.—Patient reports for examination. He voids urine naturally with a fairly good stream and without pain. Urination is more frequent than normal, the interval being generally about two hours, but sometimes

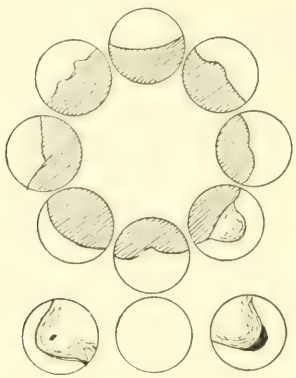


FIG. 19.—Cystoscopy one year after perineal prostatectomy, Case No. 10.

he is unable to go more than one hour, and when the desire to urinate comes on, it is very imperative and he must void at once—there is no incontinence. He gets up about three times during the night. There has been no hematuria, no calculus, no pain in back, hips, legs, groins, or testicles. He has not lost weight, and his general health is good. He is engaged in light occupation.

Examination.—The patient looks well, lips of good color. The epitrochlear and cervical glands are not palpable. In the right groin there are several shot-like indurated glands.

Rectal.—In the region of the prostate is a transverse mass somewhat irregular and nodular, in places soft, in others quite hard, this extends up on each side into the region of each seminal vesicle and there is also induration between the vesicles, the upper edge of which presents a broad concaved border which extends outward towards the pelvis on each side. In the region of the left vesicle the induration is most marked and it extends along the pelvis beyond the reach of the finger. It is distinctly nodular and quite hard, no enlarged glands are felt on that side. On the

right side near the pelvic wall one indurated gland is felt, but it is difficult to distinguish from the nodular vesical adjacent to it. The induration of the prostate extends down and involves the membranous urethra, and is very close to the skin of the perineum. The bulb of the urethra is not involved.

Cystoscopic.—A small rubber catheter passes with ease and finds 35 cc. residual urine, bladder capacity 260 cc., on forced distention. The cystoscope is firmly grasped in the urethra, but enters after some pressure Examination of the prostatic orifice shows a small induration in front and on each side as shown in accompanying chart, Fig. 19. In the median portion of the prostate there is an irregular enlargement which is continuous with the rounded elevation of the trigone on both sides, this elevation extends back and involves the region around the ureteral orifices. On the right side the ureteral orifice is seen on the summit of a globular projection. On the left side the ureteral orifice cannot be seen, but it is probably on a similar projection adjacent to a diverticulum which is shown. The middle portion of the trigone is not so much involved as the lateral portion. The mucous membrane is everywhere smooth and there is no villous tumor or ulceration. With finger in rectum and cystoscope in urethra it is impossible to feel the beak of the instrument there being a considerable mass between.

Urine acid, 1013, trace of albumin, considerable pus, many bacilli.

Pathological examination.—The specimen, G. U. 77, consists of three pieces of prostatic tissue, two of which represent the right lobe and one the left, total weight is only 8-G. Consistency of the tissue is very hard, and was adherent to the capsule. On cross section the tissue is not lobulated, and composed of spheroidal bodies as one sees in the usual benign hypertrophy. The surface is somewhat granular and numerous fine yellow points are seen scattered here and there in a white field. The prostatic ducts are not visible, and one gets the impression of a very dense tissue. The general appearance is much the same in all three portions of the prostate removed.

Microscopic examination.—The carcinoma presents itself in the form of tubules in an apparently normal looking stroma. These tubules evidently represent acini which have become carcinomatous, and are of varying sizes. The tubules are lined by a cylindrical epithelium which is very pale staining with small sometimes good sized round nuclei. The epithelium at times grows out in strands from the periphery uniting and interlacing in different ways so that irregular shaped open spaces are formed. (See Fig. 14.) These epithelial strands apparently have no supporting framework of stroma. In other tubules the epithelium fills the entire lumen with cells of a pavement type while again the mass of irregular shaped clear cells grows out from one point of the periphery to the lumen of the tubule. The tubules are for the most part separated by considerable bands of normal looking fibro-muscular stroma, in other areas they are fairly closely aggregated. The epithelium does not seem to be of a malignant type and nowhere does it seem to break through the wall of the tubule and infiltrate

the surrounding stroma. In a section obtained from one portion of the prostate a myomatous form of hypertrophy was encountered, the muscle occurs in large bundles, occasionally atrophic looking acini being present in the myomatous nodule and at other times being pressed together about the periphery of the myomatous nodules. The picture, however, in this myomatous portion is not always a malignant one. The acini seem to be those normally present which are undergoing compression and atrophic changes as a result of the myomatous hpyerplasia, but in other portions (see Fig. 15) definite nests of cancer cells are seen. That the picture presented by the tubular adenomatous form of growth described above is a malignant one is demonstrated beyond doubt by the finding of several nests of cancer cells in the lymphatic spaces of several nerve sheaths in the periphery of the prostate.

Case 11.—*Carcinoma of the prostate. Malignancy suspected at operation, but radical operation not attempted.*

J. R., aged 78, widowed, admitted June 26, 1905.

Complaint.—"Frequent and painful micturition. Catheterism."

Gonorrhœa 40 years ago.

Present illness began about four years ago with frequency of urination. This gradually increased, but three months ago urine was voided about every hour, since then the patient has used a catheter four times a day. Between catheterizations he is able to void urine with considerable straining and at frequent intervals. No hematuria, no gravel, no incontinence. Both testicles have been swollen.

Sexual powers.—Erections have been absent for the past three years.

Examination.—The patient is well nourished, strong and healthy looking, with lips of good color. The pulse is regular and strong and only moderately sclerotic. The heart, lungs and abdomen are negative.

Rectal.—The prostate is moderately enlarged, round and smooth. The right lobe is the larger, and is slightly indurated, but elastic and does not extend into the region of the seminal vesicle. Several indurated cords run upward from it to the lateral wall of the pelvis. The left lobe is smaller, softer, and there are no indurated cords. The seminal vesicles are not palpable. There is no intervesicular mass, no enlarged glands and the rectal mucosa is soft.

Cystoscopic.—A catheter passes with ease and finds 250 cc. residual urine. The bladder is irritable, the urethra very long. The cystoscope apparently cannot be introduced into the bladder. The field is dark and it is impossible to see anything. A silver catheter gives a grating sound in the prostatic urethra which suggests calculus.

Urinalysis.—No note.

Preliminary treatment.—For four days the patient was catheterized two or three times a day and from 200 to 300 cc. residual urine being obtained. He voids urine in small amount with considerable pain and vesical spasm. Urotropin and water in abundance.

Operation June 30, 1905.—Ether. Perineal prostatectomy by the usual

technique. The posterior surface of the prostate was smooth, globular, not difficult to separate from the rectum and felt only slightly indurated. Examination of the lateral incisions showed a benign appearance. The left lateral lobe, a portion of which projected well up into the bladder was removed in three pieces. The right lateral lobe was a little adherent at the upper end and had to be excised with scissors. Examination of this portion showed a large oval, firmly encapsulated lobule, the cut surface of which was deep yellow in color, homogeneous and finely granular, cartilaginous in firmness. The rest of the prostate was soft, and semi-translucent. Examination of the capsule and seminal vesicle at the upper end of the right lobe showed induration and a portion of this tissue was excised and removed with scissors. This induration extended into the median portion of the prostate, and it was thought best to excise the median portion along with the ejaculatory ducts suburethrally. No mucous membrane was excised but the urethra was torn. Palpation above the prostate failed to reveal any glands or definite evidence of invasion. Although the operator suspected carcinoma the age and condition of patient prevented a radical operation. There was only a moderate amount of hemorrhage, the wound was closed as usual with double tube drainage and light packs for the lateral cavities. Infusion on table, continuous irrigation on return to the ward. Pulse at the end of the operation was 105. Condition good.

Convalescence.—The patient reacted well. The temperature arose to 101.4°, but after the second day was practically normal.

The gauze and tubes were removed at the end of 24 hours, there was very little bleeding. There was considerable hiccough on the night after the operation, and the patient was slightly irrational. A second infusion was given on the second night, and on the two successive nights. The hiccough persisted for a week, at first being distressing, but later only occasional. He was treated by hydrotherapy, liquid diet, and purgatives. After the ninth day his condition improved rapidly, the temperature remained normal, and the patient was up daily and soon began to walk. The wound healed nicely, urine began to come through the urethra on the seventh day, on the 28th day only a pin-point fistula remained, and he was able to retain urine for several hours. He was discharged on the 30th day.

March 14, 1906.—Patient returns for examination. He says his general health is good and he has gained 15 pounds in weight. The perineal wound has remained closed, he voids urine naturally and in a good stream, there is no incontinence. He rises only once or twice at night to void and retains urine four hours during the day. He suffers no pain, not even a burning. He has had no erections since two years before operation. He considers himself cured. The patient voided 160 cc. slightly cloudy acid urine, sp. gr. 1010. He says fistula closed one week before leaving hospital.

Pathological report.—The specimen, G. U. 179, consists of four pieces,

the left and three pieces comprising the right lateral. On gross examination the left lateral presents the usual picture of benign hypertrophy, and several spheroids are present. There is nothing in this tissue microscopically which suggests carcinoma. The right lateral, however, over about ⅓ of its area presents a picture entirely different from the benign hypertrophy. The right lobe shows rather typical glandular hypertrophy except in an area occupying ⅓ of the upper surface where the tissue is very smooth and shiny, homogeneous and of a peculiar brownish color. This tissue makes up a lobule of its own and seems rather definitely demarcated from the normal looking tissue below. This area suggests very strongly carcinoma, and cuts with a marked gritty sensation.

Microscopic examination.—Sections from the left lateral lobe show a normal adenomatous type of hypertrophy, although occasionally one sees an acinus in which the proliferation is rather profuse and the epithelium shows slight involution changes. Sections from the malignant looking area show an adenocarcinoma. The alveoli are small, at times very closely set with comparatively small amount of stroma and in other areas the stroma and acini being in about equal amount. The acini are extremely irregular in shape, and nowhere simulate closely normal acini. At times strands of epithelium infiltrating in the stroma are seen. Occasional small limited areas in which the growth is rather scirrhus in type are to be seen. The growth, however, is practically a pure adenocarcinoma.

Case 12.—*Carcinoma of prostate, membranous urethra and right seminal vesicle. Stricture of urethra. Complete retention of urine. Catheterization impossible. Refused to go to hospital. Emergency perineal prostatectomy for drainage, at residence. Later operation for complete excision refused. Result of operation good.*

No. 1102. J. E. H., age 64, married, admitted November 4, 1905.

Complaint.—" Acute retention of urine."

Gonorrhœa in his youth, no sequelæ.

On August 26, 1904, and February 16, 1905, had attacks characterized by frequent desire to urinate. At other times felt well.

Present illness began six months ago with a sudden severe pain which came on during urination, and was located in the end of the penis. It lasted one-half hour. Previous to this urination had been normal, the stream large, no hesitancy, no increased frequency, did not get up at night. Since the attack above described he has had similar seizures at intervals of two to three weeks. The pain was generally located in the penis, but at times it was referred to the hips or radiated down the legs to the toes. Micturition has been markedly increased, difficult and the amount voided small. There has been no hematuria. His general health has been good and there has been no loss in weight. Yesterday for the first time complete retention of urine came on. His physician was called in this morning and made several attempts to catheterize him without success. I was then consulted, found the patient suffering greatly from

an overdistended bladder which reached almost to the umbilicus. All attempts to pass instruments into the bladder were unsuccessful. Various catheters and filiforms were used without success, owing to an obstruction about seven inches from the meatus, and apparently located at the apex of the prostate. With the finger in rectum the catheter was found to stop at a point in the membranous urethra.

Rectal examination showed a prostate which was slightly enlarged in both lateral lobes. The surface was somewhat irregular, very hard, and there was a slight mass of induration about 1 cm. wide at the base of the right seminal vesicle continuous with the upper end of the prostate, and also occupying slightly the notch in the median line. Above that the seminal vesicle was negative on both sides. The membranous urethra was enlarged, hard, and there was a peculiar prominent prolongation of the prostatic induration which was closely attached to the membranous urethra on the right side, had an irregular surface and was extremely hard. The rectal mucosa was soft and no enlarged glands were to be felt. The patient was advised to go to the hospital, but refused. The diagnosis was not positive. The stricture seemed to be in the region of the membranous urethra, and it was thought possible that the process was of a chronic inflammatory character, though the possibility of malignancy was suspected. After consultation with his physician and family it was thought best to provide perineal drainage after division of the stricture, and at the same time to enucleate the lateral lobes of the prostate. The general condition of the patient was excellent—there has been no loss of weight.

Operation November 4, 1905.—Ether. At home of patient. Perineal prostatectomy by the usual technique. The membranous urethra and apex of the prostate were exposed as usual. The rectum was very adherent to urethra and prostate, and had to be dissected free. The posterior surface of the prostate was very little larger than normal, slightly rough and very hard. Continuous with the apex of the prostate, and extending somewhat to the left was a prominent mass of induration closely adherent to the membranous urethra, and about 1½ cm. long by 1 cm. wide. The surface was very irregular, and so intimately adherent to the levator ani that dissection was necessary to free it. The rest of the membranous urethra was thickened and hard, but presented much the appearance of an ordinary stricture. Owing to the inability to pass an instrument urethrotomy was performed without a guide. The lumen of the membranous urethra was extremely small and the strictured condition extended into the prostatic urethra so that it was necessary to pass a filiform and forcibly dilate the prostatic urethra before the tractor could be introduced. Through the usual bilateral longitudinal incisions, the lateral lobes of the prostate were excised. They were markedly adherent to the urethra, capsule and bladder and the scissors had to be freely used. Examination of the tissue removed showed marked induration, a cut surface of almost homogenous appearance, no evident dots and lines of softer material, and the appearance of a very fibrous prostatitis. The surface was somewhat

gritty when scraped with the knife, but all present agreed that the appearance was not sufficiently suggestive of carcinoma to warrant the radical operation. There was apparently no middle lobe present and the median portion of the prostate was not removed, the urethra and ejaculatory ducts were preserved intact. The mass of supposed scar tissue around the membranous urethra was excised. Double tube drainage and light packs for the lateral cavities was provided, and the wound closed as usual.

Convalescence.—The patient suffered greatly from pain in the wound and bladder and difficulty of urination. These symptoms persisted, and at the end of a week a catheter was passed and showed considerable residual urine. An operation was decided upon for two reasons, viz.: To remove an obstructing median bar, which was undoubtedly present, and to obtain additional tissue for microscopic examination, the specimen removed having been lost by the nurse.

Second operation November 12, 1905.—The wound was reopened and the prostate exposed with the posterior retractor. The floor of the urethra, the median ejaculatory bridge, median portion of the prostate, and a portion of the neck of the bladder on the left side was excised, leaving a large opening into the bladder. Examination with the finger showed no remaining prostatic enlargement, no intravesical tumor, no ulcer. Examination of the specimen removed showed that the base of the right seminal vesicle had been removed. Microscopic examination showed carcimona. Radical operation was proposed and absolutely refused by the family.

Convalescence.—The patient reacted well from the operation, was very much more comfortable. The urine escaped through the perineal wound. The gauze and tubes were removed within two days, and the perineal wound closed finally on the 15th day. Interval urination was at once established, and the intervals between urinations gradually increased. On January 8, 1906, the patient started from New York to the West Indies.

March 3, 1906.—The patient voids with ease at intervals of two hours and only gets up once at night to urinate. Occasionally he has a slight dull pain in the deep urethra, and constantly a dull pain in the anterior portion of the right thigh. No pain in back, perineum or rectum.

Examination.—The patient looks well and has gained in weight. The urine is clear, and microscopically negative.

Rectal.—In the region of the prostate an indurated mass about 4 cm. wide and 3 cm. long is palpable. The rectum is adherent to it and is distinctly rough though not ulcerated. An indurated mass extends upward and outward from the upper portion of the right lobe of the prostate for a distance of 3 cm. It is about the size of the little finger, surface is smooth, and the upper end is sharply defined. No enlarged glands are to be felt, and the region of the left seminal vesicle is negative. The perineal wound is firmly closed.

April 4, 1906.—The patient can retain urine from two to three hours.

Some nights does not get up at all. Last night had to get up every hour to urinate; urination difficult, came in drops and was accompanied by severe pain in the lower abdomen. No pain to-day and is voiding well.

Examination.—Urine is clear, no infection present. The patient looks well.

April 5, 1906.—The patient enjoys good health. Voids urine freely, often only once at night. He suffers very little pain and complains most of a disagreeable tickling sensation in the urethra.

Pathological examination.—The specimen, G. U. 195, consists of several pieces of prostate and a portion of the lower end of a seminal vesicle. On gross examination it is fibrous and dense and areas suggesting the presence of epithelium are only indistinctly made out. On microscopic examination there are areas usually in the neighborhood of glands of the prostate, but also near the seminal vesicles which are rich in cells. These cells are partly derived from connective tissue cells, but others occur in strands and nests and apparently are of epithelial origin. These masses of epithelial cells arranged in alveoli are growing irregularly and lawlessly in the cellular connective tissue. These areas occur in several scattered patches in the section, but especially in close association with the glands. The stroma in relation to the alveoli is fairly abundant and occasionally nuclear figures can be detected.

Diagnosis.—Carcinoma, simplex scirrhus type.

Case 13.—*Carcinoma of prostate and seminal vesicles. Catheter life advised but refused. Perineal prostatectomy to relieve obstruction. Death,*

S. No. 18897. O. H. D., 76, married, admitted March 17, 1906.

Complaint—"Enlarged prostate."

No history of venereal diseases. Ten years ago had a fistula in ano for which he had an operation. Two years ago the patient was thought to have Bright's disease on account of the frequent passage of large quantities of urine. After that there was a gradual increase in the frequency of urination, but without difficulty, pain or dribbling. Six months ago he had difficulty in voiding for the first time. There was a constant desire with frequent voiding of small amounts and almost constant dribbling of urine. About the same time he began to have pain of a stinging, burning character, extending from the neck of the bladder to the meatus, and occasionally severe paroxysms in this region. The condition gradually grew worse, and three weeks ago he began to use a catheter at first only once at night, and since then more frequently. Catheterization is difficult and is generally done by an attendant. With its use he gets some comfort, but without it voids six or eight times during the night, and cannot sleep on account of the pain. He has never had hematuria nor any pain in the rectum, thighs, legs or back. It is worse when the bladder becomes full and during urination and is located in the neck of the bladder and urethra. He has lost ten pounds during the past few years and has become considerably weaker. He has suffered considerably from constipation and a difficult stool causes pain in the bladder.

Sexual powers.—Sexual desire and erections are still present. Coitus satisfactory, ejaculations not painful.

Examination.—The patient is a well nourished man, with lips of good color, but he seems unusually weak. There is a cataract in the right eye and a post operative coloboma in the left. The chest is funnel-shaped, the costal angle being markedly increased. Expansion is equal, but expiration is prolonged and the percussion note hyperresonant. The heart is not enlarged and the sounds are clear. Pulse 76, regular, with good volume, slight arterio-sclerosis. The abdomen is negative.

Genitalia.—There is a slight hydrocele on the left side.

Rectal.—The prostrate is considerably enlarged, particularly in the transverse diameter. The surface is irregular, and the consistence of an extreme hardness. The induration extends upward into the region of the seminal vesicles on both sides, and there is also an intravesicular mass of induration the upper end of which can be reached with difficulty. Running upward and outward on the right side are several hard cords which extend along the walls of the pelvis beyond the reach of the finger, they are also present on the left side. No enlarged glands can be felt. The rectum is soft, but closely adherent to the prostate.

Cystoscopic.—A coudè catheter passes with ease and finds 756 cc. residual urine. The bladder capacity is large. The cystoscope could not be introduced owing to an obstruction about one inch behind the external sphincter apparently at the median portion of the prostate. With the finger in the rectum it is felt to pass through the apex of the prostate without meeting obstruction, but it is impossible to get it into the bladder and considerable hemorrhage was produced.

Urinalysis.—Cloudy, 1017, acid, no sugar, albumin in small amount, microscopically pus cells.

Remark.—The patient's physician was told that a catheter life was the safest method of treatment. He argued that the patient would rather die than continue to suffer as he had, and that he would not be able to use the catheter and strongly urged a partial perineal prostatectomy. Although the patient was weak there had been so little loss of weight that it was thought possible to do a perineal enucleating prostatectomy without much danger.

Operation March 20, 1906.—Ether. Perineal prostatectomy by the technique usually employed for benign hypertrophy. After incision of the membranous urethra very great difficulty was found in introducing the tractor into the bladder, owing to a greatly contracted condition of the entire prostatic urethra, and much valuable time and a fair amount of blood was lost while attempting to get various instruments into the bladder. Finally the tractor was introduced and the operation carried out without very much difficulty. The posterior surface of the prostate was quite adherent to the rectum and had to be freed very carefully. The lateral lobes of the prostate were enucleated with the aid of finger and scissors quite completely. It was then thought best to remove the

suburethral and median portions of the prostate, and in so doing the floor of the urethra was removed. The tissue was evidently carcinomatous and the disease extended well beyond the limits of the prostate. There was apparently very little intravesical outgrowth. There was more hemorrhage than the usual prostatectomy, but the patient's pulse did not rise above 92, and was 90 at the end of the operation. An infusion was begun early in the operation. Double tube drainage and lateral gauze packs for the lateral cavities were provided, the levators were approximated and the skin wound partially closed with catgut as usual. Continuous irrigation on return to ward.

Subsequent course.—On return to ward the pulse was 80 and regular. Patient was restless and complaining of pain. At 6.30, two hours after the operation, his pulse was 88. He was seen by the ward physician and his condition was very satisfactory. Three hours later his pulse was weak, 112, and his hands were somewhat cold. The irrigation fluid was bloody but not excessively so, and there was a moderate amount of blood in the dressings. An infusion was started and pressure put upon the pads over the wound. After that he slept well, and his pulse during the night ranged from 112 to 116. About 6 a. m. he became much weaker and his pulse difficult to count. When seen by the ward physician he was in a stupor, respirations 32 to the minute; he was difficult to arouse and the pulse could not be counted. There had been no hemorrhage since the evening before and the irrigating fluid was running clear. An infusion was started, and at 8 a. m. a transfusion was begun. For a while after this the patient rallied, and at 10 o'clock the pulse was 132 to the minute and fairly strong, and the patient answered questions. He was given frequent hypodermics of brandy and strychnia, also ergotole and digitalin, and the pulse remained fairly good until 2.45 p. m. In the meantime the respirations had been becoming gradually shallower and more rapid, and the pulse soon became very weak, and the patient died at 4.25 p. m., 24 hours after the operation.

Autopsy.—Showed no intravesical hemorrhage, no extravasation of blood into prevesical or perirectal spaces.

Pathological examination.—The specimen, G. U. 257, consists of eight pieces, the lateral lobes being much the larger. The lateral lobes are hard in consistency, and on cutting give a gritty sensation. The cut surface shows no lobulation, but presents a rather smooth, dense appearance, with slight yellowish specks here and there. Numerous hemorrhagic points are seen scattered throughout the surface.

Tissue comprising the median bar and intravesical portion show no involvement of carcinoma. Portion of the left seminal vesicle is attached to the upper end of the left lateral and the carcinoma has apparently invaded this region. On gross examination it would seem that the carcinoma has involved both lateral lobes in their entire extent, and then has travelled up posteriorly into the region of the seminal vesicles, apparently sparing the prostatic tissue about the vesical orifice. This method of the extension of the disease has been noted in other cases.

At autopsy it was found that the entire posterior portion of the prostate and prostatic urethra had been removed. The growth involved both vesicles and intravesicular space and had apparently infiltrated the posterior wall of the bladder in the region of the trigone, but had not broken through into the bladder, the vesical mucosa being smooth. The right seminal vesicle is involved clear to its tip and converted into a dense, hard mass, but the tip of the left seminal vesicle was apparently free from disease. Both vasa deferentia in their lower portions were so involved in the carcinomatous mass that it was impossible to dissect them free. The lower end of the ureter was not involved on either side, although the right seminal vesicle was in very close proximity to the lower end of the ureter on that side. Extensive metastases to the pelvic glands are present, some of the glands being several cm. in diameter.

Microscopic examination.—Sections from the lateral lobes show a carcinoma in which numerous small, irregular shaped, mostly elongated acini are present, in a rather abundant stroma. The acini are lined by cells, irregular in size and staining qualities, and the same might be said of the nuclei. The acini often lose their lumen, and one sees nothing but strands of cancer cells in between the stroma bundles. Sections taken from about the vesical orifice in its lower portion show this tissue largely uninvaded. The greatest number of the sections from the lateral lobes show a carcinoma of a distinct scirrhus type (see Fig. 12) with a large amount of stroma, some tendency to the formation of acini being noted here and there. Sections taken from the region of the seminal vesicles show the walls of the vesicles invaded by scattered nests of cancer cells with no tendency to form acini. The lumen of the vesicle is apparently not invaded. In a section from one of the metastatic pelvic glands, the gland tissue is found entirely replaced by cancer growth of an adenomatous type.

The carcinoma in this case is almost entirely of the scirrhus variety except in some few areas where a formation of small, irregular acini is to be seen. The metastases to the glands are of the adenocarcinoma type.

Case 14.—*Carcinoma of prostate and seminal vesicles; duration one year, malignancy not recognized. Partial perineal prostatectomy. Improved.*

S. No. 19,016. J. M. P., age 60, married, admitted April 11, 1906.

Complaint.—" Retention of urine."

No history of gonorrhœa.

Present illness.—For about one year the patient had to get up two or three times at night to urinate, but he has had no particular difficulty until 10 days ago when urination became frequent and difficult. This steadily increased until yesterday, when he was unable to void at all. His physican attempted to catheterize him, but was unable to introduce a catheter. The bladder was then aspirated suprapubically, since then he has not voided. There is no history of pain in back, hips or thighs and he has never had hematuria.

Examination.—The patient is a well nourished man. Heart, lungs, and abdomen are negative. The glands in the groin are palpable and about the size of a small pea.

Rectal.—The prostate is considerably enlarged, irregular, somewhat nodular and indurated. The right lobe is larger than the left and extends somewhat into the region of the seminal vesicles both of which are indurated. Several hard movable glands the size of a pea are palpable. The rectal mucosa is soft and not adherent. The patient has complete retention of urine and is unable to void. He is catheterized with some difficulty and a considerable amount of urine withdrawn.

Urinalysis.—Catheterized specimen. Bloody, 1015, acid, no sugar, albumin in moderate amount. Microscopically red blood corpuscles.

Treatment.—The patient was catheterized for six days at regular intervals. He was unable to void and suffered considerable pain in the bladder and penis. The urine is continually bloody and on this account the operator thought that cystoscopy would be impossible.

April 17, 1906.—Operation. Ether. Perineal prostatectomy by the usual technique for benign hypertrophy (malignancy not having been recognized). The rectum was stripped from the prostate with more difficulty than usual owing to adhesions. The prostate was not greatly enlarged and quite hard. The usual lateral incisions were made on each side of the urethra and the lobe of the prostate removed. The left lobe was very slightly enlarged being hardly more than 2 or 3 cm. in diameter, but the right lobe was a little larger, measuring 2 x 3 x 4 cm. in size.

Considerable difficulty was experienced in enucleating the lobes owing to intimate adhesions to the capsule. (No note made as to the median portion of the prostate, but apparently none was removed.) Frozen sections were made at once by Dr. Geraghty and showed definite carcinoma. "Radical operation, however, seemed to present very little hope of cure." The cavities were packed with iodoform gauze, double drainage tubes inserted into the bladder, the levator muscles drawn together with catgut and the skin wound closed with interrupted sutures of catgut. The patient stood the operation well. Infusion and continuous irrigation on return to the ward.

Convalescence.—The patient reacted well. The temperature rose to 101° on the night after the operation, but was normal on the second day and remained so. The tubes and gauze were removed 24 hours after the operation. He was out of bed on the second day after the operation and voided urine through the anterior urethra on the thirteenth day. He was discharged on the 17th day in excellent condition, the perineal wound completely closed and voiding urine naturally through the urethra, with fairly good control but with considerable urgency.

Rectal.—"In the region of the right lobe there is a firm smooth mass 3 or 4 cm. in diameter. On the left side there is a much smaller mass 2 cm. in diameter, the median portion is present. The seminal vesicles are indurated and there is no induration of the base of the bladder. Glands are present in the groin, about 1 or 2 cm. in diameter but are soft."

Pathological examination.—The specimen, G. U. 279, consists of two pieces, the left and right lateral lobe. The right lateral lobe is a mass weighing about 4 gm., its consistency is firm and cuts as though extremely dense. The cut surface of the mass has a yellowish granular appearance with numerous small seed calculi scattered throughout, and the tissue presents none of the typical picture of prostatic hypertrophy.

A frozen section was made from the tissue, and showed it to be an adenocarcinoma. The left lobe is a mass weighing about 1 gm., and has the same character as the right lateral.

Microscopic examination.—A section from the right lateral lobe shows an adenocarcinoma with a moderate amount of stroma. At times one sees areas where acini seem fairly normal and are lined by a normal looking epithelium, but in other areas the acini are atypical and lined by epithelium showing involution. (See Fig. 17.)

Occasionally one sees an acinous where the epithelium in breaking through and infiltrating the immediate stroma. At times the acini are filled with cancer cells. In the section from the periphery of the right lobe and including some periprostatic tissue one finds carcinoma, simplex type. Solid alveoli of cells are present in the areolar tissue. Masses of cancer are present in the lymphatic spaces about the larger blood-vessels, and in several places have invaded the small nerve bundles. The type of cells which one sees in this extraprostatic extension of the disease is rather peculiar, the cells are rather polygonal, clear and with a round small nucleus, but the nuclei may vary in size a great deal. They suggest cells of endothelial origin.

C. Suprapubic Prostatectomy, Two Cases.

The prostate has been enucleated suprapubically in two cases, in both of which the malignant nature of the disease was not recognized. One of these was operated in 1898 by another surgeon and resulted in death 30 hours after the operation. Autopsy showed numerous pelvic metastases. In the second case which is given in full in the previous paper I failed to recognize the malignant nature of the disease and performed suprapubic prostatectomy after removing a very large vesical calculus. It was impossible to separate the prostatic lobes from the urethra, and the entire prostate was shelled out in one mass along with its urethra. The malignant nature of the disease was not discovered until several years later, when the patient returned complaining of a tumor of the kidney. He reported that there was no difficulty or frequency of urination and that the operation had cured him completely. Rectal examination, however, showed an indurated mass in the region of the prostate and study of the microscopic sections of the prostate removed at operation showed carcinoma, thus

explaining the nature of the supposed kidney tumor. The patient died four years after the operation, having been entirely free from urinary disturbance.

CASE 15.—*Carcinoma of prostate and seminal vesicles. Metastases of numerous glands. Duration two years. Complete retention of urine. Suprapubic prostatectomy. Death.*

S. No. 7455. C. B., age 67, married, admitted February 23, 1898.

Complaint.—"Dribbling of urine and bleeding from urethra."

The patient is in a very weak condition and it is impossible to get a very accurate history. The present illness apparently began two years ago with frequency of urination. Since then there has been a gradual increase in difficulty and frequency of urination, and of late he has had considerable pain. Complete retention of urine came on 12 days ago, and he was catheterized twice. Since then he has been able to pass urine in small amounts and has had considerable hemorrhage.

Status præsens.—Continuous dribbling of urine, occasional hemorrhage, much exhaustion, great deal of pain (location not noted).

Examination.—The patient is a sparely nourished old man, with very pale mucous membranes. Lungs negative. Heart: A soft systolic murmur at apex.

Abdomen.—The abdomen is distended and palpation and percussion reveal a bladder which extends above the umbilicus. The abdominal muscles are tense and examination is painful.

Rectal.—The prostate is pushed towards the anus by an over-distended bladder. It is considerably enlarged, irregular and nodular, but the surface is smooth rather than rough, and the consistence very hard. (No note made as to the seminal vesicles and regions above.)

Operation.—Owing to the traumatism that had been produced by previous attempts at catheterization the bladder was aspirated through the suprapubic region, and 1300 cc. urine removed.

Urinalysis.—Urine very dark, bloody. Microscopically red blood corpuscles, no bacteria.

Treatment.—During the next six days a catheter was passed once and 1400 cc. bloody urine withdrawn. Numerous other attempts at catheterization were unsuccessful, and the patient was aspirated seven times. The condition of the patient improved, though he was still quite weak, and the urine became clear. As catheterization was still impossible, operation for drainage became necessary.

Operation, March 1, 1898.—Dr. Cushing. Suprapubic cystostomy for drainage. Partial prostatectomy. The prostatic orifice was small and surrounded by a mass of prostatic enlargement which had the appearance of a huge cervix uteri. There were no clefts and no middle lobe present. On the surface of the prostatic mass were several small pedunculated bodies whitish in color, and one papillomatous tumor the size of a cherry. The bladder was thickened and trabeculated, but there was no vesical tumor or

ulcer present. A V-shaped incision was made in the median portion of the prostate, and several fairly large lobules of prostatic tissue removed by enucleation. An attempt was made to remove the lateral lobes of the prostate, but it was found impossible to enucleate them. The bladder was closed around a drainage tube and the muscles drawn together with sutures.

Subsequent notes.—The patient recovered from the operation well, and had a comfortable night. On the following afternoon his pulse became very small, there was very little urine excreted. His condition grew gradually weaker and he died about 30 hours after the operation.

Autopsy.—Carcinoma of the prostate, metastases to pelvis, abdominal and retroperitoneal lymph glands, to seminal vesicles and to the right kidney. Acute pyelitis, pyelonephritis. Tuberculosis of lungs. Beginning broncho-pneumonia. There was a large glandular mass at the bifurcation of the aorta, and at the bifurcation of the iliacs on both sides. Metastatic gland at the neck of the gall bladder. Metastatic processes could be followed up along the lymph glands as far as the pancreas. There were numerous enlarged glands in the pelvis. The prostate had grown largely toward the bladder. An irregular cavity was present in the median portion from which the operator had removed a small part of the enlargement. The bladder itself was free from disease. Examination of the posterior surface of the prostate showed a large rounded surface, somewhat irregular in contour. The seminal vesicles were contracted, much smaller than normal, and situated upon the posterior surface of the prostatic mass, and apparently not involved. The ureters appeared normal, and there was no carcinoma adjacent to them.

Microscopic sections showed carcinoma of the median portion of the prostate removed at operation; of the portion of right lobe of prostate and of the papilloma excised from left lobe of prostate at operation; of the seminal vesicles (which were entirely replaced by carcinoma), and of glands from the bifurcation of iliac vessels and near the rectum. The trigone was not involved by the carcinoma.

The carcinoma presents varying pictures. In quite extensive areas one finds a typical carcinoma simplex, large alveoli filled with epithelium, and surrounded by firm bands of fibrous tissue. At times these alveoli are numerous and lie close together with slender bands of stroma interlacing between the alveoli, and at times insinuating their way in the alveoli and partially subdividing them. In other areas the carcinoma assumes adenoma type often grouped in areas where they are much in excess of the stroma. Here and there one finds both in the adenomatous and the alveolar portions a marked tendency to infiltrate the stroma.

A section from a metastatic gland shows a diffuse carcinomatous involvement without any tendency to formation of acini.

Case 16.—Carcinoma of the prostate. Suprapubic prostatectomy including the urethra. Excellent result, no further urinary disturbances. Death from retroperitoneal metastases four years later. (See Case II. in previous paper.)

D. Bottini Operation, Seven Cases.

The Bottini operation was employed to relieve prostatic obstruction in seven cases. In four of these cases the diagnosis of carcinoma was made, and the operation employed simply as a palliative procedure with distinct improvement in all four cases. (Cases 17, 19, 22, and 8).

In three cases (Cases 18, 20 and 21), the malignant nature of the enlargement was not recognized, and the Bottini operation was employed, as I was using it to the exclusion of other methods at that time. The results obtained were very good in all three cases. In one case the obstruction recurred and the patient died within a year (Case 18). In the second case (Case 21) the result was excellent for 16 months when symptoms of obstruction again appeared, and suprapubic cystotomy for drainage had to be employed three years after the Bottini operation. The last case (Case 20) has been remarkable for the immense benefit conferred by the Bottini operation. He is now almost four years after the Botti operation free from pain and discomfort, although the prostate and seminal vesicles are markedly involved and general glandular metastases are present.

A review of these seven cases shows several remarkable results with the Bottini operation, and it is a question yet to be decided as to whether it or perineal prostatectomy is the preferable operation where it is desired to relieve the patient from the necessity of painful and difficult catheterization, and the discomforts of life with a suprapubic drainage apparatus.

These cases were all operated upon by the writer and are as follows:

Case 17.—*Carcinoma of prostate and seminal vesicles. Duration four months. Great frequency and large residual. Bottini operation. Improvement. Death within a year.*

No. 161. J. T. T., age 53 years, widowed, admitted October 2, 1899.

Complaint.—"Bladder trouble."

No previous history of gonorrhœa.

About 12 years ago the patient began to have frequency of urination and pain in the bladder and urethra. This, however, passed off soon and he had no further trouble until eight years ago, when frequency of urination and hematuria recurred. After that there was very little trouble until four months ago, since which time he has had great frequency and difficulty of urination, but there has been no hematuria and no note was made of pain.

S. P.—Micturition at very frequent intervals and with considerable difficulty; no hematuria, no pain complained of.

Examination.—A fairly well nourished man. Arteries slightly thickened, lungs moderately emphysematous. Heart sounds normal.

Abdomen.—The bladder is considerable dilated, palpable several inches above the pubes.

Rectal.—The prostate is greatly enlarged, being about the size of an orange. The surface is very hard, and irregular, with small nodules. In the region of the left seminal vesicle is a very large, hard mass, which extends upward and outward along the pelvic wall, and above it several indurated lymphatics can be felt. No note made as to the condition of the right seminal vesicle nor as to enlarged glands.

Instrumental.—A silver catheter passes with ease and finds 850 cc. residual urine. The bladder tonicity is good. Total urethral length is 9½ inches. With finger in rectum and catheter in urethra it is impossible to feel the beak when turned downward, owing to great increase in thickness in the subtrigonal and median prostatic tissues.

Diagnosis of carcinoma was made, but owing to distress of the patient a Bottini operation was suggested as a means of relief.

Operation, November 21, 1899.—Bottini operation. Four per cent eucaine was injected into the urethra. Three cuts were made, each about 3 cm. in length, with current at white heat. There was very little hemorrhage. The patient stood the operation well, and voided urine more easily afterwards.

Convalescence.—The patient had no chill and passed a fairly comfortable night after the operation. He voided urine quite freely and had very little hemorrhage. On the third day after the operation he returned for examination; the urine was clear, he was voiding quite easily and felt greatly improved. He was seen about four months after the operation; his condition was very greatly improved, and he was at work. The interval between urination was as long as three hours during the day and only four times at night. There was still some straining during micturition. Examination of the prostate showed about the same condition as before operation.

November, 1901.—The patient cannot be found, and it is reported that he is dead.

Case 18.—*Reported in full in previous paper, Case III. Carcinoma of prostate and seminal vesicles, frequent and difficult urination, completely relieved by Bottini operation. Death one year later.*

Case 19.—*Carcinoma of prostate and vesicles. Duration eight months. Complete retention of urine, catheter life.—Bottini operation.*

No. 291. S. D. D., age 62, married, admitted May 28, 1902.

Complaint.—" Enlarged prostate."

Denies gonorrhœa.

Present illness began eight months ago with difficulty in urination. This gradually increased until finally complete retention of urine came on and since then he has led a catheter life. He is now unable to void urine,

and has lost considerably in weight and strength. No note as to pain or hematuria.

Examination.—The patient is thin and weak. His lips are of fair color, heart, lungs and abdomen negative.

Rectal.—The prostate is moderately enlarged, very irregular, nodular and hard. (Notes in regard to the seminal vesicles lost.)

Cystoscopic.—A catheter passes with ease, the bladder is contracted and is very irritable. Cystoscopic examination showed an intravesical enlargement of the prostate, very irregular in character, certainly malignant. Examination unsatisfactory on account of hemorrhage.

Operation May 30, 1902.—Local cocaine anesthesia. Bottini operation. One median and two lateral cuts, each about 3 cm. in length. During the operation the finger was kept in the rectum. Patient stood the operation well. There was very little hemorrhage and no pain.

Convalescence.—The patient had a slight chill, but was in good condition the next day. On the day after the operation he voided 1075 cc. in 14 urinations, the amounts varying from 55 to 100 cc. He did not require catheterization after operation, and left the hospital on the seventh day, voiding urine in a fairly good stream without pain or difficulty, and feeling well.

April 10, 1906.—Letter from physician. After returning home the patient had pain in the region of the prostate, hematuria, and continued loss of flesh. Urination did not become more difficult and catheterization was not necessary. He was not troubled with constipation or any rectal trouble, and no further operation was necessary. The patient died August 24, 1902.

CASE 20.—*Reported in full in previous paper, Case IV. Carcinoma of prostate, malignancy not suspected. Excellent result. Entirely comfortable now four years after Bottini operation.*

CASE 21.—*Reported in full in previous paper, Case V. Carcinoma of prostate and seminal vesicles. Excellent result after Bottini operation maintained 16 months. Suprapubic drainage. Death several weeks later, two years after Bottini operation.*

CASE 22.—*Carcinoma of prostate with large intravesical lobes and involvement of vesicles. Bottini operation. Death. Autopsy.*

No. 623. G. S., age 72, married, admitted January 20, 1904.

Onset one year ago with difficulty and frequency of urination. This increased rapidly and six months later patient had complete retention of urine. Since then he has been unable to void voluntarily. No history of hematuria. Of late he has suffered severely of pain in the course of the sciatic nerve and right leg is swollen. Has lost weight and strength.

General examination.—Anemic, weak looking man. The right foot, leg and thigh are swollen and œdematous. Examination of the right groin shows an irregular induration in the region of the vessel just beneath Poupart's ligament, it is not definite that this consists of enlarged glands.

Rectal.—Prostate very much enlarged, hard and irregular. Large nodules forming the posterior surface. It is apparently closely adherent to rectum and the induration extends upwards into the region of both seminal vesicles. The prostate extends far to the right and is closely adherent to the pelvic wall. Cystoscopic examination shows a large collar-like intravesical prostatic outgrowth with many large, irregular lobulations. No definite deep sulci as in simple hypertrophy cases, no ulceration. The diagnosis of carcinoma was made, and it was thought best to continue to use the catheter. The patient suffered so much pain from the use of a catheter that he begged for an operation—a Bottini was accordingly performed. Following this the patient was able to void urine without a catheter, although at very frequent intervals. He still had considerable pain in the rectum and down the posterior surface of the right thigh, although this was somewhat less severe than before operation, but he continued to grow weaker, and was discharged in April, 1904.

Autopsy.—There is a hydronephrosis of the right kidney—the pelvis and ureter being very markedly distended. The lower end of the right ureter is surrounded by carcinomatous tissue which compresses it. The prostate gland is about the size of a duck's egg, and the interior is ulcerated, leaving a cavity as large as a walnut communicating above with the bladder and below with the urethra. Carcinoma has invaded the wall of the bladder until the walls are some places nearly an inch in thickness and the mucous membrane is in many places ulcerated. The pelvic and lumbar glands are slightly enlarged, but a gland taken from the lumbar region shows microscopically no metastases. A lymph gland from the pelvis shows microscopically carcinoma. Sections from the spleen and liver are negative. With the exception of the carcinoma in the prostate, bladder and pelvic lymph glands, no other mention is made of carcinomatous involvement.

Case 8, *in which a perineal prostatectomy was first employed, and later Bottini operation to relieve recurrence of obstruction, and reported in full in previous paper, Case VI. Slight improvement, death a few weeks later.*

E. Castration, Two Cases.

Castration was performed for the relief of prostatic obstruction in two cases. In one case the operator did not recognize that the disease was carcinomatous, and performed castration, which was then in vogue, in order to produce an atrophy of the enlarged prostate. Suprapubic cystostomy for drainage was provided at the same time. The result was negative and the patient wore a suprapubic drainage apparatus until the date of his death a year or so later.

In the second case which was operated on by the writer, the diagnosis of carcinoma was evident. There was no frequency or difficulty

of urination, but the patient complained of severe pain in the rectum, buttocks and limbs. No operation to relieve obstruction was indicated, and castration was performed with the hope that some change in the prostate which might bring about relief of the rectal pain, might follow. The result, however, was negative. These cases are as follows:

CASE 23.—*Carcinoma of prostate and vesicles. Duration six weeks. Symptoms: Frequency of urination, obstruction, straining, loss of weight. Suprapubic cystostomy.*

Surgical No. 6478. R. J. C., age 64, married, admitted April 25, 1897.

Complain.—"Frequent urination."

Gonorrhœa at the age of 34, no gleet or stricture following.

Onset six weeks ago with difficulty and straining at urination, which has continued up to the present time, urination being very frequent. Two weeks ago he consulted a physician who, after rectal examination, told him he had a tumor along the rectum. He has not had complete retention of urine but has been instrumented once.

S. P.—Micturition every 15 or 20 minutes, with great difficulty and straining. Has lost ten pounds. Health excellent.

Examination.—The patient is healthy in appearance.

Rectal.—The prostate is moderately enlarged. No note as to consistence. In the region of the right seminal vesicle is an oblong nodular mass which is very hard but not tender. In the region of the left seminal vesicle there is a similar but smaller and less nodular mass. A large distended bladder can be felt. On abdominal examination it is found to reach the umbilicus.

Instrumental.—A stone searcher is passed with some difficulty into the bladder, owing to constriction of the prostatic urethra. With finger in rectum and searcher in urethra a very great increase in the suburethral portion of the prostate was made out, and it is markedly indurated, almost cartilaginous.

The amount of residual urine was not determined, the bladder having been aspirated a few hours before, 1000 cc. urine withdrawn.

Urinalysis.—Pale, 1004, no albumin, no sugar, microscopically a few pus cells.

Operation May 3, 1897.—Double castration. Suprapubic cystostomy for permanent drainage of bladder. Suture of tube to bladder wall. Examination with the finger showed no enlargement of the median portion of the prostate. The urethral orifice was small and admitted the tip of the little finger with difficulty. The mucous membrane of the bladder was smooth.

Convalescence.—The patient reacted well. There was considerable leakage around the tube, but the castration wounds were protected by collodion. A good sinus formed and a Bloodgood bag was provided. The patient

left the hospital on May 31, in excellent condition, the urine draining freely into the bag.

August 27, 1897.—The patient is still wearing the Bloodgood drainage apparatus. He has lost 23 pounds in weight, but suffers no pain. The prostate is still very firm, but seems to be smaller than before operation. His sexual power is preserved.

March, 1898.—The patient complains of great pain in the rectum and a constant desire to go to stool. He also suffers with pain in the lumbar region.

Unfortunately no note was made except to say that the diagnosis of the prostate was made. This should have been evident, however, at the first examination.

CASE 24.—*Carcinoma of prostate and seminal vesicles. Duration eight months. Pain a prominent symptom. Operation: Castration, no relief.*

No. 457. J. C., age 62, married, admitted August 31, 1903.

Present illness began eight months ago with pain in the right hip. Since then attacks of pain have recurred at frequent intervals. The pain extends from the groin through to the buttocks, and at times down side and back of leg to toes. There is a continuous pain in the rectum, but worse at times than at others. A very severe attack of pain comes on about once in 24 hours. These start gradually in rectum and from there spread to the right buttock, and down to the back of the right thigh and leg to the sole of the foot. These pains have been so severe that the patient has required morphia. He has had very little trouble with urination; only some slight hesitation at the start. Appetite and digestion good. Sexual intercourse causes pain.

Examination.—The patient is a fairly well nourished man, with lips of fair color. General examination is practically negative except for some tenderness along the course of the sciatic nerve.

Rectal.—The prostate is very greatly enlarged, projecting far into the rectum. In the center is a nodule and the remainder of the surface is slightly nodular or lobulated. The median furrow is obliterated. The enlargement is greater on the right side extending up into the region of the seminal vesicle. The vesicles cannot be made out. The consistence is hard towards the apex, but at places further back it is elastic and soft.

Cystoscopic.—The cystoscope shows very little intravesical hypertrophy. There is a slight median bar and no sulcus present. On account of the slight urinary obstruction and the fact that the bowel wall seems to be involved by the growth, castration (rather than perineal prostatectomy), was performed for the relief of pain. Following the operation the patient had definite mental disturbances. The pain was not relieved, and at times he stated that it was terrific.

The urine was acid, slightly cloudy, Sp. Gr. 1018, trace of albumin, hyaline, and granular casts, some pus cells.

Several months after patient's return home doctor reported that "he has more or less pain all the time in the rectum, hips, back, and penis."

The prostate has not diminished any in size and patient has to have opiates constantly to relieve his pain. The patient died about one year after onset of symptoms.

April 10, 1906.—Letter. The patient returned from the hospital on the 23d of September and grew worse until the 21st of January when he died.

F. Suprapubic Cystotomy for Drainage. Five Cases.

Suprapubic drainage was provided in five cases. In all of these cases urination was frequent and difficult and catheterization either very painful or hard to accomplish. In case 27, the patient was in desperate shape and suprapubic drainage was supplied as an emergency operation. In the last case (Case 28), the patient was subject to severe chills, fever and sweats, the result of absorption from suppurative processes in the prostatic urethra and prostate which was kept irritated by the passage of a catheter. The operation has had the result of completely doing away with these conditions and the patient is very much more comfortable, although he finds the suprapubic tube a great nuisance.

Our cases in which suprapubic drainage has been supplied are too few to draw conclusions from, but this operation undoubtedly has a valuable place when catheterization has become very difficult or painful and severe suppurative processes are present. In some cases, however, the use of conservative perineal prostatectomy or the Bottini operation may furnish much greater comfort for a certain period of time. There can be no hard and fast lines drawn as to the preference among these methods. Cases of carcinoma of the prostate are so varied that no one operation can be advised for all cases.

These five cases are as follows:

Case 23.—*Carcinoma of the prostate and seminal vesicles. Simultaneous suprapubic cystostomy and castration. Improved.* (See full report under cases treated by castration.)

Case 25.—*Carcinoma of prostate, seminal vesicles and trigone. Duration 10 months.. Sypmtoms: Pain, frequency of urination. Operation: Suprapubic cystostomy.*

S. N. 8756. P. D., age 58, admitted March 17, 1899.

Onset with pain in penis during and after micturition and intermittent urination. After about four months the frequency of urination became very marked and he had complete retention. Has had retention of urine every two to three weeks ever since. Pain has been constant and increasing.

S. P.—Pain in penis; frequency of urination every 10 to 15 minutes at night. Constipated. Catheterized once a day.

Examination.—Fairly well nourished. Mucous membrane of good color. Chest negative. Abdomen: Bladder palpable above symphysis. Posterior cervical and inguinal glands are palpable.

Rectal Examination.—The prostate is large, very hard and extremely irregular, larger on the right than on the left. The finger can reach above the main mass and far above on the left is felt a firm irregular round nodule entirely separated from the lower mass and situated much more posteriorly. Between this and the main mass a very small nodule can be felt. This upper nodule is freely movable, and can be rolled about and is evidently an enlarged gland. On entering hospital the patient complained of pain in suprapubic and epigastrium regions and in the right flank. There was intermittent involuntary passage of urine accompanied by much pain. A catheter was introduced with some difficulty, 1300 cc. of bloody urine being drawn off.

A suprapubic cystostomy was performed as the patient was unable to void voluntarily. At operation it was found that the prostate did not project into the bladder, but the trigone was nodular, very hard and irregular, but the mucous membrane was intact. Following operation the patient was fairly comfortable for about four weeks when he began to complain of considerable pain in the rectum and down the left leg and required morphia. No evidence of disturbed sensation over the left leg was discovered. A note May 8, says, "there is no palpable enlargement of iliac glands, no enlargement of inguinal glands. Liver palpable two finger breadths below costal margin, surface does not seem smooth. There is no jaundice." Patient was discharged May 30, 1899. Condition weak but fairly comfortable. Using Bloodgood bag. Urine Sp. gr. 1010. Alkaline. No sugar, slight trace of albumin. Considerable pus.

Case 26.—*Carcinoma of prostate and bladder, large intravesical tumor. Duration three years. Hematuria, frequency of urination, pain. Operation: Suprapubic cystostomy.*

S. No. 10,843. H. H. G., age 59, married, admitted August 28, 1900.

Complaint.—"Pain in penis and testicles, occasional passage of blood."

Gonorrhœa in youth, no sequelæ. Slight burning on urination during past 10 years.

Present illness began three years ago with pain in the penis followed by the passage of a small blood clot. After that he passed blood continuously for a few days, and at intervals ever since, hematuria has been present. Micturition has been painful, difficult, and frequent, and has gotten gradually worse. He has lost considerable weight and has become steadily weaker.

Status præsens.—Urination every 15 minutes, painful, hematuria intermittent. Emaciation and weakness.

Examination.—The patient is thin and anemic. Chest and abdomen not noted. The genitalia are negative except for a small cyst in the left epididymis.

Rectal.—The prostate is enlarged, symmetrical, smooth, and very hard. It projects considerably towards the rectum and the upper end cannot be reached. The prostate is extremely tender.

(No notes as to the condition of the seminal vesicles.)

Instrumental.—A silver catheter passes, but the outer portion has to be depressed in order to lift it over a median prostatic enlargement. No note as to residual urine. The bladder is very small, and irrigation produces hemorrhage.

Urinalysis.—Bloody, acid. Microscopically blood corpuscles and epithelium.

Operation, September 15, 1900.—Mitchell. Ether. Suprapubic cystostomy, partial excision of tumor of the bladder. Suprapubic and urethral drainage. A large intravesical tumor involving the anterior and right lateral walls of the bladder was found. The median portion of the prostate was not enlarged, and no note of any involvement of the base of the bladder was made. The tumor was curetted, but no attempt was made to excise it completely.

Convalescence.—The patient suffered considerably from pain after the operation, and it was impossible to wear a drainage apparatus owing to hemorrhage and pain. He was discharged on the 31st day, wearing a catheter in the urethra and leaking through the suprapubic wound.

Case 27.—*Carcinoma of prostate and seminal vesicles. Duration two years. Pain and frequency of urination. Suprapubic cystostomy. Death.*

S. N. 17,555. K. H., age 60, married, admitted April 1, 1905.

Gonorrhœa in youth.

Onset two years ago with frequency of urination. This gradually increased until two weeks ago, when he was voiding about every 10 minutes. For the last few weeks he has had great pain in the suprapubic region. No history of complete retention. No hematuria except that following an attempt at catheterization.

Examination.—A fairly well nourished man with mucous membranes of fair color. Chest and abdomen negative. No note as to glandular enlargement. Hemoglobin 85 per cent. On admission the patient was having great difficulty in voiding; only a small quantity being passed at a time. The fundus of the bladder was midway between symphysis and umbilicus and a catheter drew off 850 cc. residual urine. Catheterization caused rather profuse bleeding.

Rectal.—Prostate very large and hard, the finger being unable to reach the upper limit. Laterally the induration extended along the lateral walls of the pelvis. The prostate is very hard and of uniform consistency.

A suprapubic cystostomy was done. Palpation of the prostate through the wound showed it to be very hard though there were no intravesical projections of any size. Following the operation, patient's condition gradually became weaker and he died about one week later. No autopsy obtained.

CASE 28.—*Carcinoma of prostate and seminal vesicles. Duration five years. Frequency of urination, no pain, no hemorrhage. Suprapubic cystostomy. Improved.*

No. 1097. E. S. H., age 61, married, admitted November 11, 1905.

Complaint.—" Prostatic trouble."

No history of gonorrhœa.

Present illness began about five years ago with slight difficulty and increased frequency of urination. He suffered no pain and had little inconvenience until February, 1903, when he had complete retention of urine for the first time and was catheterized with great difficulty. After catheterization for three weeks he was able to void naturally. In May, 1903, he consulted a well known surgeon in Chicago, who diagnosed prostatic hypertrophy and advised the use of the catheter once daily. During the past two years the catheter has been used at intervals of two or three weeks. He has been able to void naturally and with little difficulty, but with increasing frequency. Occasionally there is considerable difficulty, and he then passes a catheter and finds about two ounces of residual urine. Catheterization is always difficult, sometimes causes hemorrhage and produces great soreness of the urethra.

S. P.—Micturition about every one and one-half hours every night and day. No apparent obstruction and very little difficulty of urination. No pain, no hemorrhage. He is constipated and often has difficulty in defecation, but never any pain in rectum, thigh, and perineum, testicles, groins or hips. His general health has been excellent, and he has not lost weight. Sexual powers apparently normal.

Examination.—The patient is a fairly strong looking man with lips of good color, but his complexion is very sallow. Pulse is good, and the arteries are not sclerotic.

Chest and abdomen; notes lost.

The epididymis is indurated on both sides and slightly tender. There are no glands in the groin.

Rectal.—The prostate is considerably enlarged in both lateral lobes. The surface is smooth. The consistence is markedly indurated. In the region of both seminal vesicles there is an indurated mass which is continuous with the prostate, and the two are connected by a wide plateau of intravesicular induration the upper end of which cannot be reached. On the right side the induration extends upward and outward along the lateral wall of the pelvis, and the surface is nodular. No enlarged glands are to be felt. The rectal mucosa is soft and not adherent, but the prostate is apparently adherent to the musculosa. The rectum is greatly diminished by the prostate which projects far back towards the sacrum leaving but little passage way. The prostate is not very tender, and is not of stony hardness, but it is much firmer and much more fixed than a benign hypertrophy. After examination there was an escape of pus from the meatus, but examination showed no bacteria.

Diagnosis.—Inoperable carcinoma of the prostate and seminal vesicles. Catheterization at bed time advised.

December 17, 1905.—The patient has been troubled with chills, fever, and sweating. This usually occurs he says after an accumulation of pus in the prostate and disappears after the evacuation of the pus. Catheterization sometimes causes great pain and hemorrhage, at other times his only pain is located in the neck of the bladder, and is relieved by urination.

March 27, 1905.—The patient has been troubled considerably with chills and fever associated with accumulations of pus in the prostate, as above described. Urination has been frequent, but not very difficult, and catheterization has been employed but seldom, and then he finds only a small amount of residual urine. He has no pain.

He has kept at his work, but has been considerably prostrated by the intermittent febrile attacks, and insists on relief. The prostate and seminal vesicles are involved in a very extensive carcinomatous mass which extends beyond the reach of the finger. Radical operation is out of the question and the patient appears too weak for palliative partial prostatectomy. Suprapubic cystostomy for continuous drainage advised.

March 28, 1905.—Operation. Ether. Suprapubic cystostomy. The bladder was opened through a very small incision at a point well towards the vertex. (To avoid impingement of tube against prostate.) Examination of the bladder with the finger showed a small median bar, with a small slightly rounded median lobe, behind which was quite a deep pouch. The lateral lobes were not intravesically enlarged. There was no intravesical tumor, no evidence of infiltration of the bladder wall. The vesical cavity was large. There was very little trabeculation and no stone. A large rubber tube was introduced and the bladder firmly closed around it with catgut. The recti muscles were approximated with catgut leaving a small area for drainage.

Convalescence.—The patient reacted well from the operation and the convalescence was uneventful. At the end of a month, a Bloodgood drainage apparatus was provided. For a time there was considerable leakage, but when the patient left the hospital, about two months after the operation, the apparatus worked fairly well.

June 16, 1906.—The patient is in excellent health. The drainage apparatus works well and gives him very little pain. He still suffers pain during defacation in front of the rectum and region of the prostate. The suppurative condition of the prostatic urethra has subsided and the patient's condition is much improved by the operation, but he finds the apparatus disagreeable to wear.

G. Perineal Drainage. Two Cases.

In two cases median perineal urethrotomy was performed, in one case on account of abscess of the prostate involving the perineum, and in the second case on account of the inability of the patient's physician to pass a catheter, complete retention of urine being present. It is

interesting to note that the physician reported that he found a stricture of the deep urethra, a condition which we have shown is frequently produced by carcinomatous involvement around the membranous and prostatic urethra.

Except in suppurative conditions such as Case No. 29, perineal urethrotomy has little to commend it. These two cases are as follows:

CASE 29.—*Carcinoma of prostate involving perineum. Abscess. Perineal incision. Death. Autopsy.*

S. N. 8610. J. R., age 56, married, admitted February, 1899.

Onset two years ago with sudden complete retention of urine. After dilatation of stricture patient had no further trouble until July, 1898, when he noticed a pain in the penis and passed a little blood. About one month later received a blow on the perineum and following there was a slight urethral hemorrhage. After this perineum gradually began to swell and on account of the pain he was obliged to go to bed. Perineum finally ulcerated and he now passes urine through fistula. Has failed a great deal in general health.

General examination.—Rather poorly nourished man. Quite weak and feeble looking. Considerable emaciation. Mucous membranes pale. No general glandular enlargement. Behind the scrotum is a cauliflower like mass presenting three distinct projections and in the center is a urinary fistula. A hard induration fills up the scrotum and the testicles are difficult to make out.

Operation.—An incision in the median line of the scrotum opened up a mass of friable tissue which encircled urethra. This tissue extended well down towards rectum and pushed the testicle forward. Urethra was very friable and replaced by this same tissue. Nothing could be passed into the bladder. Rectal examination showed a prostate very much enlarged and nodular, especially the right lobe. The friable tissue extended well down to the prostate.

Patient died about a month later.

Autopsy.—On the pelvic peritoneum in the rectal vesical portion and upon several loops of intestines without the pelvic, there are met gray elevations about 2 mm. in diameter. The whole perineum and scrotum and a large portion is the site of a very foul gangrenous ulceration extending from the margin of the anus to the most interior portion of the scrotum at a distance of 12 cm. laterally from one ischial tuberosity to the other. The scrotum is in a great part transformed to a dense white tissue of almost cartilaginous consistence. The skin is firmly fixed upon the underlying mass.

Bladder.—Mucous membrane is intact. Urethra is invaded by the perineal ulceration 2 cm. from the bladder; it is completely severed, and for a considerable distance has been eaten away by ulceration. Lying below the base of the bladder between it and the rectum is a mass of very

dense tissue approximately 6 x 5½ x 5 cm. which surrounds the seminal vesicles, is continuous with an enlarged, indurated prostate, and the infiltration in the perineum and scrotum. The recto-vesical pouch of peritoneum is indurated and nodular. The testicles are not invaded by the growth. The inguinal lymph glands show metastases, but no other than the inguinal glands involved. Kidneys, liver, and spleen are free. Microscopic study of sections from diseased areas showed adenocarcinoma.

Microscopic examination.—Numerous sections from the growth and its extensions show a rather cellular carcinoma with a loose œdematous stroma. The epithelium is distributed irregularly throughout the stroma, sometimes occurring in good sized masses with very little intervening stroma, and again slender strands of cancer cells, infiltrating in between small connective tissue bundles. The epithelium is polymorphus in shape, large giant cells with big irregular nuclei being frequently encountered. In areas the carcinoma assumes a scirrhus form, cancer cells in strands and small nests being scattered here and there with rather loose abundant stroma. There is noted no tendency anywhere to the formation of acini. Sections made from the skin of the scrotum which was involved in the growth have the same character as sections from the primary tumor mass, viz., nests of irregular cancer cells irregularly distributed in a loose stroma frame-work.

The growth is a carcinoma simplex, the medullary type predominating.

Case 30.—*Cancer of prostate, vesicles, and rectum. Duration one year. Frequent and difficult urination. Previous perineal urethrotomy "for stricture."*

No. 914. T. C. P. P., age 62, married, admitted April 28, 1905.

Onset one year ago with slight difficulty in urination and slight increase in frequency. The urinary difficulty and frequency gradually increased until he urinated every 15 minutes night and day. About five months ago had complete retention of urine and as considerable difficulty was experienced in catheterizing, a perineal section was performed. A finger passed into the bladder at the time found no intravesical enlargement, but there was marked constriction of the entire urethra. After that the patient was considerably improved and was able to void fairly well through the urethra. After several weeks he began to suffer with severe pain in hips, particularly on right side and running down legs. Fistula had to be dilated a few weeks ago and on passing a finger into the bladder there was found a small intravesical nodule growing on the right side. This was not present before.

S. P.—Continuous dribbling through the fistula—only occasionally through penis. Six months ago had some pain in rectum but this is very slight now. Considerable pain in hips and legs, along the course of the sciatic nerves.

General examination.—Patient very weak and emaciated.

Rectal.—About one inch distant from the anal margin the anterior wall of the rectum is thrown into a high transverse fold which is com-

posed of very much indurated tissue and apparently continuous with a markedly indurated prostate beneath. About one inch higher up on the right lateral wall of the rectum is a roughened irregular area about 2 to 3 cm. in diameter, this area gives the sensation of rough irregular granulations upon the surface of the mucous membrane. It is difficult to make out the exact outlines of the prostate, but it is considerably enlarged, irregular in shape, very hard, and generally closely adherent to the rectum. On the left side it is firmly attached to lateral structures of the pelvis, and seems to extend well up into the region of the seminal vesicle. On the right side the enlargement is smaller, but there is definite induration running up into the region of the seminal vesicle. On the posterior wall of the rectum in front of the sacrum an enlarged gland about 1 cm. is felt. The upper border of the prostatic mass presents a concave shape (evidently an intravesicular mass), above which a soft bladder can be felt.

No operation was advised.

H. Treated by Catheterization, 16 Cases.

Seven of these cases had complete retention of urine and led catheter lives before entering the hospital for various periods (6 weeks, two cases; 6, 9, 10 and 11 months, and 3 years, each one case). In one case the catheter had been used 4 months on account of a large residual urine. Two cases had used a catheter occasionally on account of complete retention of urine. Six cases had never been catheterized before entrance to the hospital, but all of the 16 cases required catheterization after leaving the hospital with the exception of Case 45, which required catheterization for six weeks during an attack of acute gonorrhœa (and the patient aged 76!), after the disappearance of the acute symptoms of urethritis voluntary urination returned, and Case 39, who died soon after leaving the hospital.

In six cases catheterization was apparently entirely satisfactory. In three cases no note has been made and in the other cases catheterization is very difficult and painful, but no subsequent operation has been necessary as far as I can learn.

Ten of these sixteen cases have died, all within a year after leaving the hospital. Four cases are still alive and comfortable with the exception of pain in the back and thighs, and one does not use the catheter.

A review of these cases shows that the catheter is quite successful in a fair number of cases. As a rule a soft rubber Nelaton catheter has been employed, and has usually been found to enter more easily than

a coudè catheter, owing to the fact the obstruction is due to a circular constriction of the urethra and not as a rule to marked median lobe formation.

Where catheterization is very difficult or painful or produces considerable irritation and suppuration some palliative operation, is, as a rule, preferable. The histories in which a catheter was employed is as follows:

CASE 31.—*Carcinoma involving prostate, seminal vesicles, and pelvic glands. Duration 15 months. No pain, no hematuria. Advised to use catheter.*

S. N. 9438. McK. C., age 67, married, admitted September, 1899.

No history of gonorrhœa.

Onset 15 months ago, with increased frequency of urination. Some months later began to have some difficulty in passing water and some hesitation. Never passed any gravel. No hematuria. Condition gradually became worse until six months ago, when he had complete retention. A catheter was passed with considerable difficulty. For the past six months he has been unable to void voluntarily and catheterizes himself about eight times in 24 hours. No pain noted. Has lost 40 pounds.

Examination.—Patient is fairly well nourished man. Chest and abdomen negative. No glandular enlargement.

Rectal examination.—The prostate is found to be much enlarged, very hard, firm, rough and nodular, projecting further backward on the left side. Beneath the mucosa can be felt several small, freely movable, hard, round bodies, presumably glands. These are directly over the surface of the enlarged prostate. The greatest enlargement is over the left side.

The urine is cloudy with pus; Sp. gr. 1019; faintly acid—no sugar; a faint trace of albumin.

Advised to use catheter.

CASE 32.—*Carcinoma of the prostate, seminal vesicles and pelvic structures. Duration two years. Marked constipation, difficulty of urination, pain in the abdomen. No operation.*

S. No. 12401. R. L., age 56, married, admitted September 25, 1901.

Complaint.—"Bowel and kidney trouble."

No history of gonorrhœa.

Present illness began two years ago with difficulty in urinating, and intermittent stoppage and straining during urination associated with pain above the symphysis. During the past two years this condition has persisted, and constipation has been present and gradually become worse. During the past six weeks he has had mucus in stool.

Examination.—The patient is a sparely built man with lips of fair color. There are numerous areas of pigmentation in the skin in various parts of the body. The heart and lungs are negative. The abdomen is prominent in the hypogastric region and many coils of intestine are visible. Enlarged glands are present in both groins.

Rectal.—In the region of the prostate is a firm nodular mass which extends upward beyond the reach of the finger, and almost blocks the rectum. Laterally it is attached to the walls of the pelvis and is immovable. On its surface are numerous indurated ridges. The rectal mucosa is freely movable and soft. No enlarged glands are noted.

Urinalysis.—Cloudy, 1010, acid, no sugar, no albumin. Microscopically squamous epithelial cells and a few pus cells.

Cystoscopy not performed. No urethral examination. No note as to the frequency of urination.

Remark.—The history is unfortunately incomplete, but it is evident that the patient complained largely of obstruction to the bowels. He was treated by purgatives and enemata, and was improved. No operation was performed.

April 12, 1906.—Letter from wife. "After returning home his feet and legs were swelled, urination was no more difficult, but catheterization was necessary all the time. He suffered pain in the lower part of the stomach. There was chronic constipation and enemata were necessary. No operation was performed. Before death he suffered all the time and could not retain anything. Death occurred four years ago."

Case 33.—*Carcinoma of prostate and seminal vesicles with intravesical lobules. Duration 10 years (?) Symptoms: Frequency of urination, loss of weight. No operation.*

S. N. 13,638. H. C. C., age 60, admitted July 23, 1902.

Onset with frequency of urination and hesitation. Frequency gradually increased until he was voiding from two to six times at night, and only relieved himself after considerable straining. About six weeks ago was passing urine every 20 minutes and complete retention of urine came on and he had to be catheterized. After being catheterized for some time he was able to void voluntarily. No pain except some burning on urination. Has lost 30 pounds in the last few months.

S. P.—Urination every two hours, accompanied by a slight burning in urethra. No hematuria.

Examination.—Very anemic, weak, sick-looking man. Mucous membranes pale. Chest negative. Abdomen negative, except that distended bladder can be felt above the symphysis.

Rectal examination.—Prostate moderately enlarged, contour irregular, distorted and composed of irregular lobules in places of considerable induration. Right lobe larger than left. Median furrow and notch are obliterated, and the bases of both seminal vesicles are involved in induration. Catheter readily passed and 540 cc. of urine removed.

Cystoscopic examination.—Study of the prostatic orifice shows very irregular intravesicular outgrowth of the prostate. There are many deep clefts in between lobulated outgrowths. In some places, especially the left side and above, these are frayed out and are quite suggestive of new growth. In places they are covered with fibrin and it is therefore impossible to make a positive diagnosis as to malignancy. The bladder

wall contains no neoplasm. With the finger in the rectum and cystoscope in urethra a prostatic collar about three-fourths of an inch thick is felt around the cystoscope. The lateral lobes are not markedly enlarged, but are hard. Urine contains a large amount of pus. No operation advised on account of weak condition of patient. Instructed to use catheter, which he did four times a day. The patient died five days after leaving hospital.

Case 34.—*Carcinoma of prostate and seminal vesicles. Duration three years. Frequency and difficulty of urination. Little pain. No operation.*

S. N. 15,327. S. O., age 59, married, admitted October 18, 1903.

Onset three years ago with some difficulty in voiding. Since then condition has gradually grown worse—urination has increased until it is now 15 to 20 times during the day and at night every half hour. Up to six months ago frequency not marked. For the last six months has had some pain on passing urine, but at no other time. Has lost 30 pounds in weight during the last seven months.

S. P.—Pain on urination; increased frequency—15 to 20 times during day—every half hour at night—loss in weight. No note as to retention or hematuria. Does not catheterize himself. No physical examination recorded.

Rectal examination.—The prostate is considerably enlarged in both lateral lobes, contour irregular, nodular and very hard. The region of the right seminal vesicle is indurated and adherent to the prostate. The left seminal vesicle is apparently not involved. The mucous membrane of the rectum is soft and not adherent. No glands are to be felt. The prostate presents well into the rectum.

Cystoscopic examination.—Shows an irregular mass projecting around the orifice of the prostate on the left side. The surface of this is irregular and the mass extends considerably into the bladder and is about 3 cm. in diameter. The rest of the prostatic orifice is apparently normal. The mucous membrane of the bladder is markedly inflamed. The ureters are easily seen. Urine cloudy. Sp. gr. 1010 acid; trace of albumin, numerous cells; no sugar; urea, 24 grams to liter. Diagnosis: carcinoma.

Patient advised to use catheter regularly.

April 12, 1906.—Letter. "The course of the disease after returning home was rapid. Urination was more difficult and catheterization necessary five or six times a day. He suffered pain in the back, abdomen, and rectum. Blood was frequently present in the urine, there was considerable loss of weight, and chronic constipation. No operation was necessary, and the patient died three months after returning from the hospital."

Case 35.—*Carcinoma of prostate. Duration of symptoms eight months. Catheterism. Loss of weight. No operation. Death ten days later.*

S. N. 16,033. D. S., age 65, married, admitted April 24, 1904.

No history of gonorrhœa.

Symptoms of onset.—Increased frequency of urination and considerable straining. The straining and frequency of urination have gradually in-

creased. No note as to pain or hematuria. The patient has gradually lost weight—about 20 pounds. He has been using a catheter at intervals for the past six months, and of late has been using it regularly.

Examination.—The patient is much emaciated and his mucous membranes are pale. Chest negative. Abdomen negative, with exception of tenderness in the suprapubic region, and also in both iliac fossæ. No note as to glandular enlargement. A silver prostatic catheter passes with slight difficulty, the beak being lifted by a median lobe. 180 cc. residual urine was obtained. The bladder would hold only 180 cc. of irrigating fluid.

Rectal.—The lateral lobes of the prostate are slightly hypertrophied, but hard and nodular. The median furrow is present. No note is recorded as to the seminal vesicles, and the history otherwise is incomplete, but there was no doubt expressed as to the diagnosis of carcinoma.

Urine cloudy from pus. Sp. gr. 1010, alkaline, albumin present, a few granular casts.

The patient was treated by permanent catheter and bladder irrigation, but gradually became weaker and died ten days after admission. No autopsy.

Case 36.—*Carcinoma of the prostate and seminal vesicles. Duration one and a half years. Catheter life. No operation. Death within a year.*

No. 670. Wm. G., age 69, admitted July, 1904.

Onset with frequency and slight difficulty in urination. No pain. Frequency and difficulty gradually increased until about 11 months ago, when he had complete retention and had to be catheterized. Since then has used the catheter regularly, being unable to void naturally, and he has used the catheter about every three or four hours. During the past six months hemorrhages have been very frequent and quite severe, although a soft rubber catheter is used.

S. P.—Uses catheter every two hours, night and day. No pain except on introduction of catheter. Has lost about 15 pounds in the past year. General health pretty good.

Examination.—A fairly strong looking man. Lips and mucous membranes of good color. Arteries very sclerotic.

Rectal examination.—Prostate bulges far towards rectum. It is irregular in places, nodular, and extends far out on each side. The induration runs up in the region of the seminal vesicles beyond the reach of the finger along the lateral walls of the pelvis. The upper edge of the prostate can be reached with difficulty in the median line, and on each side the limits cannot be made out. The rectal wall is closely adherent to the prostate. The consistence of the prostate is extremely hard in most places, though small, soft areas can be felt. No definite, large glands are to be made out, but in the region of the seminal vesicles several irregular cords of induration, probably lymphatics can be felt. The patient was advised to continue catheter life.

The patient died March 26, 1905. He had much pain in the region of

the prostate, and in the legs. He used a catheter successfully until four days before his death. Catheterization then became very difficult and considerable hemorrhage was produced by his physician in using catheters.

CASE 37.—*Carcinoma of prostate and seminal vesicles. Duration ten months. Pain and frequency of urination. No operation. Catheter life.*

S. N. 16,579. E. A. H., age 57, married, admitted August 24, 1904.

No history of gonorrhœa.

Onset with burning pain in rectum. This recurred at irregular intervals, but with gradually increasing intensity. About two months after onset patient developed pain in penis, scrotum and perineum which at first was intermittent but now is a continuous, dull ache. He began to get up once at night to urinate two months ago, but had very little urinary disturbance. Since then he has had tingling pains along the course of both sciatic nerves, has lost about 20 pounds in weight, but has not had hematuria nor acute retention of urine.

S. P.—Pain in rectum, penis, scrotum, perineum, tingling sensations along the course of both sciatic nerves. But slight urinary symptoms. No hematuria or catheterism. General health fairly good.

Examination.—A poorly nourished man, with mucous membranes of poor color. Chest and abdomen negative. Several small, hard glands are palpable in the left groin, and a few softer glands in the right groin. No other glandular enlargement. On rough examination slight impairment of sensation of touch on right thigh in a limited area, including slight portion of perineum and extending about one-third the distance of thigh toward knee on its internal aspect.

Rectal examination.—Shows a hard, nodular prostate, the size of one's fist. The right lobe is somewhat larger than the left and extends well over against the pelvis. The left is not so closely attached to the pelvis. The median furrow is obliterated by an intravesicular mass, the upper edge of which is very sharp. The seminal vesicles are involved in the induration. Several small, movable, hard nodules are felt on surface of the gland. A catheter is introduced without much difficulty and 500 cc. residual urine obtained.

Cystoscopic examination.—Slight enlargement of median portion of prostate. No lateral enlargements shown. With finger in rectum and cystoscope in urethra instrument is found to be surrounded by a hard nodular mass, and the beak is difficult to feel. Urine, cloudy from pus. Sp. gr. 1012; acid, no sugar; trace of albumin. The patient was advised to use a catheter.

April 12, 1906.—Letter. "The course of the disease after returning home was rapidly fatal. Urination was not much more difficult and catheterization necessary twice a day, for a while, but none at all for a month before death. The patient suffered pain in the pelvic region and down the inside of the thighs. There was no hematuria; he lost weight steadily; there was constipation and rectal trouble. He died April 3, 1905."

Case 38.—*Carcinoma of prostate, left seminal vesicle and pelvic glands. Duration, two and a half years. Symptoms: Frequency of urination; no pain; no blood; no operation.*

No. 742. J. H. D., age 67, married, admitted October, 1904.

Onset with frequency and precipitancy. This frequency has gradually increased until now he voids about every hour at night and every one to two hours during the day. No hematuria. He has been catheterized regularly for the past four months about twice a day; has lost no weight in the last few months and feels better than he has in a year. No pain except a little at the beginning of urination.

S. P.—Catheterism twice daily on account of large residual. No pain present.

Examination.—The patient is well nourished, and the mucous membranes are of good color.

Rectal.—The prostate is enlarged more so in the left than the right lobe. The median furrow is present, but the notch is shallow and just above it is a slight ledge, especially on the left side, which is quite hard. The right lobe of the prostate is very hard and has in its midst a globular mass about the size of a cherry, which is quite hard. The left lobe of the prostate is larger than the right and is continuous with an indurated mass, which extends upwards in the region of the left seminal vesicle. The left lobe and the mass above described are very hard and somewhat irregular. Along the surface of the mass above the prostate near its inner border a hard cord is to be felt. By turning the finger outward and then backward and inserting it as far as possible one can follow an indurated line of tissue, probably a lymphatic, and feel one enlarged gland. The region of the right seminal vesicle is very little enlarged, but one or two hard cords are to be felt. Residual urine, about 200 cc. is present.

Cystoscopic examination.—The bladder is considerably trabeculated. There is a slight cystitis. A marked hypertrophy of the trigone is present. There is a definite enlargement of the median portion of the prostate in the shape of a narrow transverse bar, which is continuous with the two lateral lobes, which are also slightly more prominent than normal; but there are no clefts between them. With cystoscope in urethra and finger in rectum it is impossible to feel the beak, owing to the great thickness in the median portion of the prostate. Urine cloudy from pus. Advised to use catheter.

In April, 1905, the patient had lost a great deal of weight and strength. Had also considerable pains in legs along sciatic nerves and around knees, especially on the left side.

April 12, 1906.—Letter. "After returning home the course of the disease was progressively downward. Urination was at times attended with more pain and catheterization was necessary every three to five hours. The pain was in the form of sciatica and in the region of the second lumbar vertebræ. Hematuria occurred six times. There was very great loss of weight and chronic constipation. No operation was necessary. The patient died August 11, 1905, of uremia."

CASE 39.—*Carcinoma of prostate and seminal vesicle. Duration one year. Severe pain in the abdomen, difficulty and frequency of urination. Sudden death. No operation.*

S. No. 17,199. J. N., age 57, married, admitted January 2, 1905.

Complaint.—"Pain in stomach, and in right leg. Diabetes."

The patient had gonorrhœa at the age of 18 years.

Present illness began about one year ago with difficulty in urination and pain in the end of the penis at the end of urination. Micturition was quite frequent at night. On July 18, 1904, he was admitted to the Medical Dispensary, complaining of stomach trouble, but the physical examination was negative, except that the urine was cloudy with pus. He was transferred to the Genito-urinary Dispensary, where the following notes were made: Patient complained of pain in the region of the bladder and the right groin, frequency of urination and slight straining at the end. The urine contains pus and numerous bacilli. The prostate is slightly enlarged, somewhat nodular, not very tender. The induration extends along the seminal vesicle on the left side, and in the tissue between the rectum and the prostate is a hard, round mass, 1 cm. in diameter, freely movable. The diagnosis of chronic prostatitis was made and he was treated by massage. After one month his condition was considerably improved. He was asked to come for a cystoscopy but failed to return, and did not appear again at the hospital until January 2, 1905, when he was admitted complaining of pain in the stomach and leg. He said that he had been troubled considerably with frequency of urination, often having to urinate 12 times during the night, and at times catheterization has been necessary. Of late he has been suffering with a severe pain in the abdomen, nausea and vomiting.

Examination.—The patient is well nourished, but his lips are pale. The chest is negative.

Abdomen.—The bladder is considerably distended, reaching the umbilicus. In the right groin are numerous hard glands, and in the left groin a number of smaller glands.

Rectal.—The prostate is very much enlarged. The right lobe extends over to the bony wall of the pelvis and the upper margin can just be reached. It does not bulge towards the rectum, is extremely hard, nodular. The left lobe is more prominent than the right but does not extend to the pelvic wall. The lower portion is soft and almost fluctuates. The upper end of the prostate is indurated and cannot be passed by the finger. The right seminal vesicle is much enlarged, hard and nodular. The left vesicle is not palpable. The rectum is markedly compressed by the prostatic mass.

Urinalysis.—Cloudy, acid, no albumin, no sugar, microscopically, pus cells and epithelium in large number.

A catheter passes with ease and withdraws 450 cc. residual urine. The diagnosis of an inoperable carcinoma was made. He remained in the hospital for 14 days. He suffered severely from abdominal pain and vomiting, and for two days the temperature ranged between 101° and 104°. He died suddenly January 16, 1905. No autopsy could be obtained.

CASE 40.—*Carcinoma of prostate and seminal vesicles. Duration two years. Complete retention of urine. Severe pains in buttocks and thighs. No operation.*

J. H. H. Surg. No. 17,247. A. S. R. O., age 67, married, admitted January 13, 1905.

Complaint.—" Retention of urine. Pain in legs."

No history of gonorrhœa.

Present illness began two years ago with frequency of urination which gradually increased until he often voided urine 20 times during the night. Six months ago he began to have pain in the buttocks, and posterior aspect of thighs, legs, ankles, and heels. This pain was of a dull aching character and intermittent, coming on every three or four days and lasting several hours. The pain was worse on the right side than on the left. Three weeks ago retention of urine came on and since then the patient has catheterized himself three times daily. During the past three weeks he has also had weakness of his anal sphincter and involuntary escape of feces associated with diarrhœa. There has been no hematuria and no calculus. He has lost 15 pounds during the past three months.

Examination.—The patient is sallow and slightly emaciated and pale. The lungs and heart are negative. The liver is slightly enlarged, and the bladder, when distended reaches to within 2 cm. of the umbilicus. The genitalia are normal.

Rectal.—The mucosa of the rectum is thrown into many folds and numerous small shot-like bodies are felt beneath it. The prostate is bilaterally enlarged, hard, apparently homogeneous and without nodules. The seminal vesicles are enlarged, firm, but not very hard, and are continuous with the induration of the upper portion of the prostatic lobe on each side, the right lobe of which is the larger. A chain of hard glands or phleboliths is felt along the seminal vesicles on both sides. The rectal mucosa is not adherent, there is no tenderness, the membranous urethra is thickened and indurated.

Sensations.—Analgesia is almost complete over the left buttock, the left half of scrotum and left half of penis. Catheterization is accomplished with very little sensation to the patient. Knee jerks poor. Ankle reflex absent. Dartos and cremasteric reflexes active. The left buttock hangs lower and is more flabby than the right and the gluteus on that side cannot be contracted.

Cystoscopic.—Retention of urine is complete and the catheter finds 200 cc. of urine. The cystoscope shows a moderate enlargement of both lateral lobes and a small median bar connecting the two lateral lobes without intervening sulci. The mucous membrane is everywhere smooth and there is no evidence of intravesical neoplasm. The bladder is slightly trabeculated and inflamed. The ureters are normal in appearance.

Urinalysis.—Cloudy, 1020, acid, no sugar, albumin a trace. Microscopically pus cells and bacilli.

January 22.—Dr. Thomas. The ankle clonus is just present on both sides. Voluntary movements of hip, knees, and ankles are normal.

Reflexes.—The abdominal reflexes are difficult to obtain, but are present. The measurements of both limbs are about the same, the right being a little larger. Over the buttocks on both sides the patient feels the slightest touch with the finger or a camels-hair brush. With the hair test the sense is less acute over the left buttocks, but on the right side the answers are accurate. With the needle point the answers are usually appreciated but less active on left side, and over this buttock the temperature sense is also distributed, no distinction being made between hot and cold. The sensory disturbance over the penis and scrotum seems to be more over the penis and scrotum on the left side.

January 24.—Dr. Cushing. Patient seems to be improving. The subjective sensation of numbness is much less. The electric reaction of the muscles are normal. Analgesia is almost complete over the left buttock, left half of scrotum and of penis, the needle being recognized as a hair and a hair not felt. Cold is not recognized, and warmth but faintly. No anesthesia can be detected on the left foot, heel, or little toe, but the thermic sense is less acute than on the right side. The X-ray show that the bony outlines in the sacral region are suspiciously indistinct (probably malignant involvement).

Diagnosis.—Primary cancer of prostate. Intraspinal tumor of the cauda equina? Pressure symptoms of fourth and fifth sacral. Crossed paraplegia?

August, 1905.—The physician in attendance reports that the patient died from cancer of the prostate.

CASE 41.—*Carcinoma of prostate and seminal vesicles. Duration one year. Symptoms: Frequency of urination, pain. No operation. Catheter advised.*

S. N. 17,431. W. S. C., age 61, admitted February 27, 1905.

Onset with pain in hip joints and soon after, urinary disturbance. For the past year has voided every three-quarter to one hour at night. No hematuria; no note on catheterism or retention. Has had dribbling at times. Pain in bladder region before voiding and frequent vesical spasms during the act of urination.

General examination.—Patient is healthy looking but sallow. Mucous membranes of good color. Chest and abdomen negative. No note on glands.

Rectal examination.—Prostate enlarged, both right and left lobes irregular, very hard, and nodular. The right lobe about 3½ cm. and the left about 5 cm. in the long diameter. Seminal vesicles indurated. Induration running outward and upward beyond reach. Median grove practically obliterated. Catheter shows residual urine of 425 cc. Bladder capacity on forced distention 475 cc. Urine cloudy. Sp. gr. 1005 to 1018. No sugar. Slight traces of albumin; no casts, considerable amount of pus.

Patient advised to use catheter regularly and under its use his condition was fairly comfortable on leaving hospital.

CASE 42.—*Carcinoma of prostate, vesicles, and trigone. Duration 12 years. Symptoms: Complete retention of urine. No pain or hematuria. No operation.*

No. 905. J. C., age 74, widowed, admitted April 19, 1905.

Complaint.—"Enlarged prostate."

No history of gonorrhœa.

Present illness.—About 12 years ago he noticed slight increased frequency in urination. This condition gradually grew worse until three years ago he was voiding urine from 12 to 18 times at night and often every 15 minutes during the day. Shortly afterward complete retention of urine came on and he has required catheterization since, being unable to void naturally.

S. P.—The patient catheterizes himself five times a day and gets along very comfortably. He has no pain in bladder, rectum, perineum, back, or limbs. There is marked constipation and sexual powers have been absent for several years.

Examination.—The patient is a thin, pale-looking man. Chest and abdomen: No notes made.

Rectal.—The prostate is considerably enlarged, smooth, but very hard. The seminal vesicles on each side are also considerably enlarged and very hard, being continuous with the prostate below and with each other, forming an intravesicular mass about 2 cm. wide. There are no nodules, no enlarged glands, and the rectum is soft and not adherent.

Urinalysis.—Slightly cloudy, 1014, acid, no albumin, no sugar, microscopically pus cells, bacilli and no casts.

Cyctoscopic.—Small coudè catheter passes with difficulty, being grasped along the entire prostatic urethra. The bladder capacity is small, holding only 150 cc. Retention of urine is complete. The cystoscope shows a very slightly rounded median bar with very little enlargement of the lateral lobes. The mucous membrane covering the prostate is smooth and only slightly inflamed. The trigone is drawn up close behind the median bar, is considerably hypertrophied and shows two peculiar prominent elevations to the inner side of each ureteral orifice; that on the left side being quite prominent and slightly nodular. The ureteral orifices appear normal. The bladder is considerably trabeculated and numerous small cellules are seen. There is no intravesical tumor. With finger in rectum and cystoscope in urethra, the median portion of the prostate is found greatly increased and it is impossible to feel the beak of the instrument in the bladder owing to the subtrigonal infiltration. No operation advised. To continue catheter life.

February 24.—Letter. "The patient is alive, but in constant misery."

CASE 43.—*Carcinoma of prostate, seminal vesicles, and pelvic glands. Duration four years. Frequency of urination. Catheterism. No pain, no hematuria. No operation. Catheter life.*

No. 647. R. W. P., age 73, married, admitted June 15, 1905.

Onset four years ago with difficulty in voiding and a frequent desire

to urinate. There was a gradual increase in the symptoms until about one year ago when he began to use a catheter at night and found nine ounces of residual urine. For the next few months he used the catheter twice a day, being able to void small amounts naturally, but he was finally compelled to use a catheter every two to three hours, having lost the power of voiding spontaneously, this he has been doing for the past nine months. No hematuria. Has had piles for many years and at times an aching pain in rectum, but this has not been increased by his prostatic trouble.

S. P.—Catheterism. No pain except when the desire to urinate comes on, relieved by catheter. Has lost no weight for the past few months. General condition has improved.

Examination.—A thin, emaciated old man. Lips of fair color. Chest and abdomen negative.

Urine pale, acid. Sp. gr. 1005 bacilli. Pus. Slight trace of albumin.

Rectal.—The prostate is very greatly enlarged, bulging far into the rectum, and about the size of a medium-sized orange. The left lobe is apparently a little larger than the right. The median furrow and notch are obliterated. The seminal vesicles are drawn down and are adherent to the upper end of the prostatic lobe on each side, and the left one is particularly prominent and somewhat indurated where it joins the prostate, but a little further up it is soft. The right seminal vesicle is as large as normal and somewhat difficult to palpate. Two cord like masses are apparent, one of which may be the vas deferens, but another more prominent one is felt apparently between the outside of the vesicle running in a direction upward and outward. It is impossible to say definitely what this is (an indurated lymphatic?). The surface of the prostate is generally smooth, but on pressure a somewhat nodular condition is noticed. This is due possibly to soft areas between areas of considerable induration. The prostate is very close to the rectum, but the mucous membrane is movable over it. Beneath the mucous membrane of the rectum, but apparently in the wall of the rectum there are felt several small bird-shot like masses over the region of the left lobe of the prostate. No definite peri-prostatic glands are to be felt. Enlarged hard glands are present in both groins.

Cystoscopic examination.—The prostatic orifice shows a distinct but small median lobe with practically no sulcus between it and the right lateral lobe and a very shallow sulcus between it and the left lateral lobe. The lateral lobes are hardly at all intravesically enlarged and there is no cleft between them. The surface of the prostate is everywhere smooth. With the finger in the rectum and cystoscope in the urethra it is impossible to feel the beak. There is a large mass between the two and the upper edge is very sharply outlined and declivitous. A note made at the time says, "carcinoma suspected, but further examination required." Some days later, by rectal examination under ether, the prostate and seminal vesicles were found as described before, but on examining the posterior wall of the rectum a large mass of glands matted together and considerably

enlarged was found lying between the rectum and the sacrum so high up that under ether it was difficult for the finger to get above them. Between this mass of glands in the right seminal vesicle a line of indurated lymphatics could be felt. The diagnosis of carcinoma seemed unquestionable. The patient was discharged and advised to use the catheter. Six months later patient reports that his health is greatly improved, but the urinary condition remains about the same—is obliged to use catheter every two or three hours night and day.

May 1, 1906.—The patient reports that until recently he was very comfortable. Of late he has been suffering with considerable pain in rectum and thighs. He is still leading a catheter life.

Case 44.—*Carcinoma of prostate, seminal vesicles, and pelvic glands. Duration two years. Complete retention, catheter life. Very little pain and blood. No operation.*

No. 1106. W. W. S., age 65, married, admitted November 25, 1905.

Complaint.—" Prostatic trouble."

Gonorrhœa in 1866, mild case, no gleet nor stricture following.

Present illness began about two years ago with slight difficulty of urination. This condition has gradually grown worse and one year ago the patient was arising three times at night to urinate. In December, 1904, he began to have pain in the end of the penis during urination, and slight hematuria. In January, 1905, he suffered severely from difficulty and frequency of urination, and he consulted an advertising specialist to whom he paid $300 in advance for a " cure." He was treated by instrumentation, prostatic massage, grew rapidly worse, and had complete retention of urine for the first time on February 1, 1905. Since then he has used a catheter every three to five hours, has been unable to void, and has frequently suffered a severe spasmodic pain in the bladder, coming on when it becomes full, and particularly severe when the last urine is withdrawn. There has been no pain in penis, rectum, perineum, thighs, nor back. There has been no hematuria except that noted above. Sexual desire is still present, but he had no erections for 18 months. He has lost 20 pounds during the past year.

S. P.—The patient catheterizes himself about every five hours; is never able to void naturally. He suffers no pain except when the bladder becomes full and after catheterization is comfortable for four or five hours. He suffers considerably from constipation, often strains at stool, and has pain afterwards.

Examination.—The patient is a healthy-looking man with lips of good color, pulse of good volume and regular, very slight arterio-sclerosis. Chest and abdomen not examined.

Genitalia.—The right testicle is absent having been removed on account of some " growth " eight years ago. The left testicle and epididymis are both normal and there are no enlarged glands in either groin.

Rectal.—The prostate, seminal vesicles, and intravesicular space are involved in an extensive indurated mass. The lobes of the prostate are

considerably enlarged and bulge markedly towards the rectum, are irregular in surface with numerous small prominent nodules. The membranous urethra is enlarged, hard and tender, and the bulb also feels indurated. The prostate lies very close to the triangular ligament, is firmly fixed, only slightly tender on pressure.

The region of the seminal vesicles is replaced by an extensive mass of induration continuous with the prostate and extending upward and outward along the lateral wall of the pelvis to which it is adherent on each side. The invasion is more extensive on the left side passing beyond the reach of the finger. On the right side the upper portion of the seminal vesicle is soft, but an indurated lymphatic is felt beyond it along the wall of the pelvis. A broad indurated plateau with concave upper border connects the seminal vesicles above the prostate. Enlarged glands and lymphatics are present on both sides, but none are made out in the sacral fossa. The rectal mucosa is soft and movable, but the musculosa seems to be adherent to the prostate. The induration in both prostate and seminal vesicles is of very great degree.

Instrumental.—A coudè catheter meets obstruction at the apex of the prostate. A small soft rubber catheter passes with ease. Retention of urine is complete, bladder somewhat contracted. The cystoscope could not be passed owing to obstruction near the apex of the prostate. The prostatic secretion is alkaline and contains numerous white masses which under the microscope are found to be composed of epithelium. Stained specimen adds no further information. Numerous pus and granule cells are present.

Diagnosis.—Carcinoma of the prostate and seminal vesicles. Operation not advised.

April 16, 1906.—Letter. "About a month after leaving you the slight bloody mucous discharge stopped. Catheterization has been necessary every four to six hours. There is considerable pain on inserting the catheter in the deep urethra. Hemorrhage has been present only once. There has been a gain in weight, no constipation, no rectal trouble and no operation. General health and appetite are good. Sleep well. No pain except when using the catheter. I am better, suffer less and am more comfortable than at any time."

Case 45.—*Carcinoma of prostate and seminal vesicles. Duration one year. Acute gonorrhœa six weeks. Complete retention of urine. No pain, no blood. No operation. Catheter for a time.*

No. 1133. R. J. T., age 76, widowed, admitted January 5, 1906.

Complaint.—"Enlarged prostate, complete retention of urine, acute gonorrhœa." He had never had gonorrhœa previously.

Present illness began about one year ago with frequency of urination, the patient having to arise two or three times at night to urinate. There was also difficulty in voiding, but no pain nor hematuria. During the fall of 1905, urination was somewhat frequent and difficult, the intervals being about every three hours, but there was no pain and no hematuria. About

November 20, 1905, he acquired gonorrhœa and was treated by methylene blue internally. Urination soon became difficult and on December 1, complete retention of urine came on and he was catheterized. Since then he has been catheterized twice daily, the urethral discharge has continued, gonococci have been found several times, he has had no pain except when the bladder becomes full. He has lost no weight and has had no pain in the back, rectum, thighs, or legs.

Status præsens.—There is a profuse urethral discharge, but very little irritation in the urethra or bladder, and no pain except when the bladder becomes full. Retention of urine is complete and the patient is catheterized two or thre times daily. His general health is excellent.

Examination.—The patient is a strong healthy-looking man. Chest and abdomen, no notes made.

Genitalia.—There is a profuse urethral discharge which microscopically is found to be composed of pus cells and numerous intracellular biscuit-shaped diplococci which decolorize by Gram and are evidently gonococci. There are no enlarged glands in the groin.

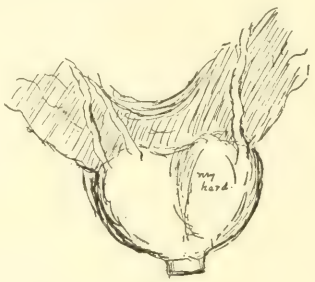


Fig. 20.—Prostate and region of seminal vesicles.

Rectal.—The prostate is considerably enlarged, smooth, hard. The right lobe is very prominent and extremely hard. The region of the seminal vesicles and the intervesicular space is occupied by a broad hard mass of induration as shown in the accompanying diagram. (See Fig. 20.) This induration extends upward and outward along the wall of the pelvis to which it is closely adherent. It is continuous with the indurated prostate below and extends beyond the reach of the finger.

On the right side a markedly indurated lymphatic is felt, and on the left side two similar cords, as shown in the diagram. The prostate is not tender, there are no areas of fluctuation, nothing to suggest acute prostatic infection. It is evident that the gonorrhœa has not acutely involved the prostate.

Remark.—Carcinoma of the prostate was at once suspected. The patient was given injections of one-half per cent protargol, and was instructed to inject some of this into the bladder after catheterization.

On January 10, he began to void naturally, the discharge had decreased considerably and the infection markedly, but few gonococci were still present.

On January 11, the patient was voiding naturally, but frequently, a catheter found 640 cc. residual urine.

Cystoscopic examination.—The urethra was thoroughly irrigated before instrumentation. The bladder was difficult to wash clean owing to considerable pus being present. The cystoscope entered easily and showed a slight rounded median bar. The lateral lobes were hardly at all enlarged and there was no cleft between them in front. There were also no clefts on either side of the slight median lobe. The ureters were plainly visible, and there was no evidence of subtrigonal infiltration to be seen. The bladder was trabeculated and inflamed, but not ulcerated and there was no vesical tumor present. With finger in rectum and cystoscope in urethra it was impossible to feel the beak owing to a considerable mass of tissue between it and the rectum in the intravesicular space. The posterior commissure of the prostate was also greatly thickened so that it was impossible to feel the shaft of the instrument. The induration was very marked and the picture was typical of carcinoma.

January 12, 1906.—The patient has again required catheterization. There is a profuse urethral discharge, but no gonococci are found. The patient is discharged at his request with instructions to continue use of protargol and catheterize himself when necessary.

April 9, 1906.—Letter from physician. "Since February 1, the patient has not required catheterization, and he has voided urine normally. He now is enjoying good health, passes urine regularly without a catheter and suffers no inconvenience whatever."

Case 46.—*Carcinoma of prostate and seminal vesicles.. Duration of prostatic symptoms four years. Frequency of urination, occasional retention, severe pain in urethra, perineum, rectum, and thighs. No operation. Catheter advised.*

S. B. S., age 74, married, admitted March 29, 1906.

Complaint.—"Enlarged prostate."

No history of gonorrhœa.

Present illness began three or four years ago with difficulty in starting the flow of urine and straining. This was especially marked in the morning. There was no pain or burning in passing urine, no difficulty in stopping the flow and no dribbling. The condition as above described persisted without any noticeable change until six weeks ago, previous to this he voided urine only once or twice during the night, had never had hematuria nor pain in the rectum or thighs. Six weeks ago acute retention of urine came on requiring catheterization. Since then he has been able to void urine occasionally in small amounts, but has used the catheter from one to four times every day. The residual urine has generally been between three and four ounces. He has suffered considerable pain, paroxysmal in character, coming on with attempts to void and situated in the perineum and thence radiating to the glans penis. He has also had an intense pain in the rectum, and down the left thigh and leg. A dull aching pain has been present across the sacrum. He has

never had hematuria, has not passed gravel, has lost 15 pounds in weight and considerable strength.

Sexual powers.—No note made.

Status præsens.—Micturition difficult, frequent often every hour. Catheterization occasionally necessary. Residual urine generally between three and four ounces. Severe pain in urethra, perineum, rectum, and thighs, dull pain in back, sacral region.

Examination.—The patient is fairly well nourished, lips of fair color. The chest is barrel-shaped and very hyperresonant and expiration is prolonged. The heart is slightly enlarged, and its beat is very irregular. The abdomen is negative. Genitalia.—There is a small cyst of the epididymis on the left side and an incomplete inguinal hernia on the right.

Rectal.—The prostate is considerably enlarged, particularly on the right side. The surface is smooth, but the consistence is markedly indurated there being no soft areas. The induration extends far upward on the right side forming a large mass in the region of the right seminal vesicle closely adherent to the pelvic wall and extending back beyond the the reach of the finger. On the surface of this mass several indurated cords are felt. The region of the left seminal vesicle is also invaded by induration, but to a less extent than on the right side. A considerable intravesicular plateau of induration with a sharp concave upper edge is present. No enlarged glands are to be made out. The prostate is markedly fixed in the pelvis, the rectum is soft and not adherent.

Remark.—The diagnosis of carcinoma was evident, and as the patient was able to use the catheter comfortably, no operation was advised and cystoscopic examination was not performed.

I. Catheter Not Used, 18 Cases.

In 18 cases no history of the use of a catheter before or after operation has been obtained, but in four cases it has been impossible to get word from the patient. Nine cases have been heard from and are still alive. Three of these patients suffer from incontinence of urine. In one case (Case 60) there is no difficulty or frequency of urination and the only symptom is swelling of the leg and thigh due to pressure of the tumor, which is very large. One patient (Case 54) has improved considerably since his discharge from the hospital 10 months ago, and he now voids urine with very little difficulty and pain, and another patient (Case 56) reports that urination is natural. Most of these patients suffer considerably from pain in the rectum, back or thighs, and in some cases it is very severe. In two cases (Cases 60 and 62) there is little or no pain.

It is interesting to note that so large a percentage of these cases of carcinoma of the prostate, at least 20% are able to get along very

well without a catheter and in some cases without any urinary disturbance whatever even up to the time of death. The histories of these cases are as follows:

CASE 47.—*Carcinoma of prostate. Metastatic tumor of tibia, diagnosed sarcoma and amputation of thigh performed. Little urinary trouble. Death. Autopsy.*

S. N. 4642. W. B. M., age 74, married, admitted September 24, 1895.

Gonorrhœa several times in youth.

Onset with frequency of urination six years ago. Has never had any pain. About one month ago had complete retention and had to be catheterized. Since then has used the catheter regularly about three times a day. Occasionally voids voluntarily. A note made at this time states that prostate gland is very hard and enlarged.

In February, 1897, patient was readmitted for a painful swelling of the right tibia of three months' duration, beginning about 7 cm. above internal malleolus and involving shaft for a distance of 3½ cm. Had some dribbling of urine at this time, and voided about every two hours, but apparently was not using a catheter. The tumor of tibia was diagnosed sarcoma and amputation performed by Dr. Halsted. A note on prostate made at this time states that it was "greatly enlarged, irregular, hard, nodular—may possibly be a new growth in region of prostate." At this time pain in hips and legs was complained of.

In July, 1897, patient was cachectic and had lost a great deal of flesh. Could retain his urine five hours and had no difficulty in voiding. Suffered considerable pain in the right hip and in the shoulders and back. Had no urinary trouble or symptoms of enlarged prostate at this time. Patient died in September, 1897.

Autopsy.—Prostate is very much enlarged and adherent to surrounding structures posteriorly; elsewhere it is sharply circumscribed. The tissues at the upper end cannot be differentiated from one another, and no distinct pelvic lymphatic glands are to be seen, everything being matted in a firm, fibrous mass. The glands along the vertebræ do not show metastases. The second, third and fourth lumbar vertebræ, the second rib and the ilium are the bones showing greatest evidence of disease. The bladder wall is not infiltrated by carcinoma. In the tissue posterior to the prostate is a tumor filling the blood vessels and invading the structures surrounding them. One enlarged bronchial lymph gland next the bifurcation of the trachea shows a carcinomatous metastases.

Abdominal viscera not involved.

Microscopic examination.—Sections from the prostate, bones and bronchial lymph glands present a type of growth similar in all. Areas of a tubular adenomatous form alternate with conglomerate masses of cells which have lost their arrangement in tubules. There is very little stroma between the tubules, cells of a cylindrical shape project into them, meeting one another in the mid line. The cells are often vacuolated,

and the nuclei are round and deep staining. In the areas of carcinoma solidum the picture often suggests that of round celled infiltration cr lymphoid nodules, the cells having lost their usual shape and the nuclei staining deeply and regularly. The carcinoma is of a mixed type, tubular adenocarcinoma and carcinoma solidum.

CASE 48.—*Carcinoma of prostate and vesicles. No operation.*

S. No. 8744. J. V. J., age 60, widowed, admitted March 13, 1899.

No history of gonorrhœa.

Onset one year ago with a slight pain in right testicle, radiating to the right iliacal region. This pain has gradually grown worse. Six months ago he began to have difficulty in retaining urine and some frequency of micturition.

S. P.—Pain as above noted; frequency of urination, twice during the day, and about every hour at night; precipitancy. No pain on urination. No note as to hematuria, retention or catheterism.

General examination.—Rather poorly nourished man. Mucous membranes pale. Chest unimportant. Abdomen negative, except for some tenderness over the symphysis pubis.

Glands.—Deep down in the iliac region a definite mass of enlarged glands is to be made out. The glands in each groin are considerably enlarged, as are the axillary and epitrochlear. There is a hydrocele present on the right side.

Rectal.—In the region of the prostate is a very hard tumor, consisting apparently of two spheres, of which the right is much the larger, and adherent to the lateral pelvic wall. Between the two there is a deep groove in which the finger can be laid. The left lobe is somewhat lower than the right, about 3 cm. in diameter, can be completely encircled by the finger, is smooth in outline and perfectly round. The right lobe is more than double the size of the left, the surface is also smooth and rounded. Both lobes are hard and unyielding and both project well into the rectum.

Urine.—Cloudy. Sp. gr. 1020, slight amount of albumin, numerous pus cells. The pain in the right iliac region was of such a severe character, and there being no doubt as to the malignant character of the prostate, patient was given morphia. In the right iliac region large glands were easily palpable deep down, and they were very sensitive to pressure. No operation advised.

CASE 49.—*Carcinoma of prostate and seminal vesicles. Duration, eight months. Frequency of urination, constipation, dull pain in the bladder.*

S. N. 9441. J. M., age 57, married, admitted September 20, 1899.

Gonorrhœa twice in youth.

Onset eight months ago, with intermittent pain in bladder and increased frequency of urination. Urination has gradually increased until he is voiding six to eight times at night, and of late has had some dribbling,

has lost 40 to 50 pounds during the last two months and has grown much weaker. Has been jaundiced and vomited frequently. Has never had complete retention.

Status præsens.—Frequency of urination with slight incontinence; considerable straining on voiding, no hematuria, no history of complete retention or catheterization. Considerable failure in general health. A dull pain in the bladder region is present. Bowels constipated, but no pain on defecation.

Examination.—A rather poorly nourished man; looks somewhat anemic. Chest negative.

Abdomen.—The bladder is greatly distended, reaching above the umbilicus. There is a slight glandular enlargement in both groins, no other enlargement noted.

Rectal.—The prostate is very large, filling anterior half of pelvic outlet. It is uneven in contour, nodular, and bound down on the left side. On the left side low down there is a distinct nodule on the surface; notch cannot be palpated. No cystoscopic note. Diagnosis of carcinoma evident.

Urine fairly clear. Sp. gr. 1020, no sugar, trace of albumin, some pus. Operation not advised.

CASE 50.—*Carcinoma of prostate, seminal vesicles and base of bladder. Duration, two years. Symptoms: Frequency of urination, hemorrhage and pain. No operation.*

S. N. 11,479. R. M. C., age 60, admitted January 28, 1901.

Onset with an attack of strangury, elevation of temperature, pain at neck of bladder, bloody urine, pain and tenesmus after urination. The attack gradually subsided, but the patient did not entirely recover health and strength for one year. After that he felt fairly well until six weeks ago, when he noticed blood in urine, slight pain after urination, aching at neck of bladder. He now gets up to void about twice at night, stream free and never interrupted. Has had a glycosuria from 10 to 15 years. Some history of calculi passed several years ago, but no renal colic. No important loss of weight.

General examination.—Well nourished; lips somewhat pale; no glandular enlargement. Chest and abdomen apparently negative. Catheter shows a residual of 15 cc. and bladder capacity of 250 cc.

Cystoscopic examination shows a general cystitis. In the region of the left ureter, about an inch from it on the left lateral wall a small polypus about the size of a toothpick, the length about 1½ cm., the outer end frayed out, is seen. On account of hemorrhage thorough study of bladder was not obtained. A further cystoscopic examination three weeks later showed that behind the urethral orifice the mucous membrane was much corrugated, irregular and swollen and about half way between the prostatic orifice and the point where the right ureter should be, a depressed ulcer was visible. In the region of the right ureter the mucous

membrane was rough, granular and the ureteral orifice could not be made out with certainty. The left ureter was seen in an elevated ridge and between it and the other ureter the trigone was much changed, elevated, rough and granular. The prostate orifice was rough, but did not give the appearance of a hypertrophied prostate.

Rectal examination revealed an irregular indurated condition at the upper end of the prostate, the outlines of which were obscured, the induration probably involving the bladder and the seminal vesicles. There was no definite enlargement of the prostate, but the feeling on palpation combined with the cystoscopic picture suggested malignancy, although nothing positive could be said except that an ulcer existed in the trigone, surrounded by a much swollen, corrugated, elevated, granular mucous membrane. No papillomatous or cauliflower growth present.

Urine.—Reddish, 1020, acid, slight sugar; heavy ring of albumin; microscopically, much blood and pus.

April 18, 1906.—Letter from physician. "The patient has been dead for two years."

Case 51.—*Carcinoma of prostate, seminal vesicles and bladder. Duration, eight months. Symptoms: Pain, hematuria, loss of weight. No operation. No catheter.*

S. N. 15,288. C. H. D., age 64, admitted October 8, 1903.

Gonorrhœa at 15 years of age.

For the past 20 years an indefinite history of obscure bladder trouble characterized by an occasional attack of frequency of urination, some burning, at times a little blood in the urine; eight months ago frequency and burning became more marked and urine bloody. About the same time began to suffer with pain in the lower right side, which seemed to have its origin in the region of the perineum and right testicle and to descend along the cord as high as the umbilicus. In May, 1903, cystoscopic examination was performed by Dr. Cabot, of Boston, who found a small ulcer to the left of the right ureter. The prostate was very slightly enlarged at the time, but the seminal vesicles, cord and testicles were negative. The paroxysms of pain in the right side gradually increased in intensity and apparently had no connection with urination—he would have several attacks in the course of a day. During the course of the last months these pains have radiated down the right thigh into the foot and sole. The urine at this time and for some months previously has contained pus and blood.

S. P.—Severe pains as above noted, which require ¾ gr. of morphia daily; loss of strength; about 12 pounds in weight in the last six months. Urinary disturbance is not very marked and apparently causing but little trouble in comparison to the pains referred to above.

Examination.—Spare, sallow man. Mucous membranes of fair color. Abdomen negative except that in both iliac fossa and above symphysis there is a considerable tenderness. One or two glands just palpable in right groin.

Rectal examination.—The prostate a little larger than normal. The right lobe is quite indurated and extends upward and is continuous with the seminal vesicle, the lower part of which is indurated. Left seminal vesicle is not indurated, and left side of prostate also not indurated. A very small amount of bloody residual urine is present.

Cystoscopic examination not very satisfactory, but a large intravesical tumor, which is apparently on the right side of the bladder, is easily seen. It is close to prostatic orifice and apparently springs from the trigone. It is impossible to study the prostatic orifice.

April 16, 1906.—Letter from physician. "After returning home the course of the disease was characterized by progressive emaciation until death ensued January 16, 1904. Urination was not more difficult, and catheterization was never necessary. For a month before death he had slight incontinence. There was considerable pain, and persistent constipation. No operation was necessary."

CASE 52.—*Carcinoma of prostate, seminal vesicles and bladder, with an extensive intravesical tumor. Duration of symptoms, eight months Burning on urination, hematuria, pain in back and thigh. No operation. Death within two years.*

No. 502. D. H. F., age 45, married, admitted November 26, 1903.

Complaint.—"Hematuria."

Gonorrhœa 20 years ago, no sequelæ.

Present illness began eight months ago with a severe burning in the urethra, which was present all day up to 2 o'clock in the afternoon and then disappeared, only to come again the next day. This continued for four days. A little later urination became more frequent and the burning in the urethra returned. In May, 1903, he was voiding urine 10 to 12 times during the day and once at night, and there was pain in the right groin, and extending into the region of the appendix. In July hematuria first appeared, but continued slight for the next six weeks. About two months ago he had a severe attack of pain in the region of the left kidney, which radiated down the left ureter; was very acute in character, and passed off after the passage of a large amount of blood in the urine. Since then patient has had six similar attacks, and the urine has been constantly stained with blood, at times very red. His general health has remained good and he has gained in weight.

Status præsens.—Urination once at night, and at about normal intervals during the day. Urine always cloudy. General health excellent.

Examination.—The patient looks well, and his lips are of good color. Chest—no note made. Abdomen—negative, with exception of slight tenderness in the right side on deep palpation. No definite enlargement of the kidney is to be made out.

Rectal.—The prostate is very little larger than normal, but is markedly indurated, nodular, and very tender. Both seminal vesicles are enlarged and indurated, and continuous with the prostatic induration, the right vesicle being the larger.

Cystoscopic.—A catheter passes with ease and finds very little residual urine. The cystoscope shows a slight enlargement of the median portion of the prostate. The left half of the bladder and ureteral orifice are normal in appearance. The right half of the bladder is the site of an irregular tumor growth which surrounds the orifice of the right ureter, and extends backward and outward along the lateral wall of the bladder, and forward to a point just behind the prostatic orifice, but separated from it by a small area of normal mucous membrane. The surface of the tumor is papillomatous in type, in places shaggy and cauliflower like, in others villous, and in others smoothly lobulated. Several ulcerated areas are seen, the wall of the bladder apparently being involved.

With finger in rectum and cystoscope in urethra the vesical tumor is apparently continuous with the indurated vesical beneath.

Diagnosis.—Carcinoma of prostate and seminal vesicles, with involvement of bladder and intravesical tumor. Operation not advised.

March 11, 1905.—Letter. " The patient died January 12, 1905. Hematuria had been intermittent and never very severe, but urination was always very painful, and he suffered excruciating pain, particularly during the last six weeks, during which he had shooting pains in the right leg. The inguinal glands became involved and there seemed to be some involvement of the bones at the right iliac synchondrosis. The lymphatics of the right spermatic cord and of the penis were obstructed, and a small ulcer developed on the glans penis."

Case 53.—*Carcinoma of prostate, seminal vesicles and pelvic glands. Duration, four years. Pain in urethra. No hematuria. No operation advised.*

No. 985. W. J. B., age 70, widowed, admitted July 8, 1905.

Complaint.—" Bladder trouble."

No history of gonorrhœa.

Present illness began four years ago with irritation at the neck of the bladder during and at the end of urination. There was no difficulty and no frequency of urination, no pain nor hemorrhage. The irritation disappeared after drinking mineral waters, but returned six months later, and has continued up to the present time. Three years ago the patient had to get up at night to urinate for the first time. Pain began 18 months ago; first in the suprapubic region, dull in character and relieved by urination. Since then the pain has gradually increased, but has not involved any other region. He has never passed blood and has only lost 10 pounds. Has never had complete retention of urine.

S. P.—Urine is voided about 15 times daily. Micturition is difficult and accompanied by straining and the stream is small. During urination there is a pain beginning at the neck of the bladder and extending down to the end of the penis; it is severe in character. There is also a dull aching, deep-seated pain in the suprapubic region, which comes on as the bladder becomes full and is relieved by urination. He has had no pain in rectum, perineum, thighs, groins or testicles; no hematuria, and has never been catheterized.

Examination.—The patient is sparely built, lips are pale, pulse regular and of good volume. The glands in both axillæ, groins and iliac regions are palpable and enlarged.

Genitalia.—The left epididymis is indurated.

Rectal.—The prostate is greatly enlarged, particularly the right lateral lobe, the surface of which is very irregular and hard, the nodules being of very great induration. The left lateral lobe is smooth and only slightly enlarged, and in its anterior two-thirds is soft. Near its upper end, however, it is indurated and slightly irregular. The left seminal vesicle and vas deferens are distinctly palpable and slightly indurated, as shown in Fig. 21. The region of the right seminal vesicle and vas deferens are occupied by an irregular, hard mass, which is continuous with the prostate, and extends upward and outward along the lateral wall of the pelvis.

A few glands are to be felt along the left side of the pelvis. The right side and the sacral fossa are negative. The prostatic mass is firmly fixed in its position, but is not tender. The rectum is closely adherent but not ulcerated.

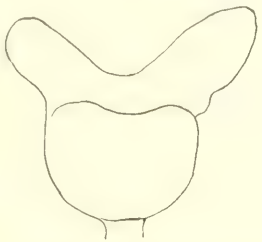


Fig. 21.—Outlines of induration in region of prostate, seminal vesicles and intervesicular space in Case No. 53.

Cystoscopic.—A coudé catheter passes with ease and finds 95 cc. residual urine. The bladder is small and irritable, retaining only 90 cc. of fluid. The cystoscope enters easily and shows a slight intravesical enlargement of the right lateral lobe with a peculiar irregular lobulated outgrowth covered by smooth mucous membrane, as shown in the cystoscopic pictures (see Case XXIX, "Cystoscopy of the Prostate"). The median bar is light and there is no enlargement of the left lateral lobe. The bladder is markedly trabeculated and inflamed, but there is no evidence of neoplasm. The ureteral orifices are normal in location and appearance. With finger in rectum and cystoscope in urethra the beak is felt somewhat to the left of the median line, the tissues between the rectum and trigone being but very little thickened. To the right of the beak, however, a considerably indurated mass is to be felt, and the median portion of the prostate is greatly thickened and moderately indurated.

The prostatic secretion contains very few lecithin cells. Several masses, apparently plugs of the prostatic ducts, were examined microscopically and were found to be composed almost entirely of epithelial cells of a coarsely granular character. Numerous large and small granule cells, free, were seen. A considerable number of polynuclear cells were present.

Case 54.—*Carcinoma of the prostate and left seminal vesicle. Large intravesical lobes, one villous in type. Duration, four years. Frequency of urination, pain, no hematuria. No operation. No catheter.*

No. 1014. D. A., age 57, married, admitted July 27, 1905.

The patient had gonorrhœa several times 20 years ago, no gleet or stricture following.

The present illness began in August, 1901, with frequent urination and burning in the perineum; this gradually increased and on May 13, 1902, he was admitted to the hospital. At that time he urinated 20 to 30 times every night, and micturition was slightly difficult, particularly at the beginning, and urine occasionally contained blood. He was not constipated and had no pain or tenesmus on defecation. There had been no loss of weight.

Examination at that time showed a well nourished man. A soft rubber catheter passed easily, there was no residual urine present, the bladder capacity was 610 cc. While in the hospital he voided urine normally, there was no residual urine, the "prostate was not enlarged"—evidently a case of irritable prostate. The patient was discharged without further treatment.

Second admission July 27, 1905.—The patient returned complaining of difficulty and frequency of urination. He says that after leaving the hospital he was comfortable for a year and then the trouble started up anew. During the past year he has had hematuria about once a week, generally associated with pain in the lower abdomen. At present he voids urine eight or ten times during the night, and very frequently during the daytime, and there is considerable burning during urination. He is quite constipated. He has kept at work up to the present time.

Examination.—Patient is well nourished, with lips of good color. The heart and lungs are negative. The abdomen is slightly distended and there is dullness 5 or 6 cm. above the pubes and in the median line, but no mass is felt. There is no œdema of the extremities (no note as to glands of groin).

Rectal.—The prostate is considerably enlarged, smooth and with a rather flat posterior surface. It is soft in the median part, but firm along the lateral edges, but the induration is nowhere of stony hardness. The induration extends upward on either side into the region of the seminal vesicles as far as the finger can reach and several enlarged glands are felt along the left lateral wall of the pelvis. In this region three small glands are to be felt. The median furrow is deep and the notch is obliterated, but no definite intravesicular mass is to be made out.

Cystoscopic.—Catheter passes with ease and finds about 50 cc. residual urine. The cystoscope shows considerable intravesical enlargement of the prostate with a deep sulcus anterior and posterior, and large bulging lateral lobes, the left of which is the largest, has an irregular surface covered with shaggy, white villi, and has the typical appearance of vesical neoplasm. Near the urethra this lobe is covered with smooth mucous

membrane. The right lobe is smooth and the mucous membrane appears to be normal. The bladder is apparently not involved by the neoplasm. The ureters cannot be seen.

Urinalysis.—Cloudy, acid, 1018, albumin in small amount. Microscopically, considerable pus; occasionally red blood corpuscles.

The diagnosis of carcinoma of the prostate was made. No operation performed.

April 10, 1906.—Letter. "After leaving the hospital I passed considerable blood at times. Catheterization has not been necessary. Urination has been moderately difficult, but associated with considerable pain. At present I am improved. I have only a slight pain when voiding urine, do not use the catheter, there is no blood. I have only lost one pound in weight."

CASE 55.—*Carcinoma of prostate and seminal vesicles and pelvis glands. Duration, two years. Pain, frequency of urination, hemorrhage, loss of weight. No operation. No catheterism.*

No. 1037. H. S., age 65, married, admitted September 15, 1905.

Complaint.—"Dribbling of urine."

No history of gonorrhœa or previous urinary trouble.

Present illness began about two years ago, with frequency of urination, which has gradually grown worse. Four months ago he began to have difficulty in voiding and for the past two months he has had continuous dribbling. About two years ago, but before frequency of urination developed, he began to have pain in the penis, testicles, back and hips, of a dull, constant character. During the past year he has also had pain down the left thigh, legs, and foot, and of late has had pain in the back of the right thigh. There has been very little pain associated with urination, no pain at the end, nor in the bladder. One and a half years ago he passed blood for the first time, but had no further hemorrhage until four months ago. Sexual powers were normal up to two years ago, but he has had no erections since then. He has not lost weight, but has become weaker.

Status præsens.—Continuous dribbling of urine. More or less constant pain in penis, testicles, back, both thighs, left leg and foot. No pain during urination nor in the urethra nor bladder.

Examination.—The patient is emaciated and pale. There is considerable arterio-sclerosis. Chest and abdomen are negative. The genitalia are negative, except for a slight tenderness in the left epididymis. The right inguinal glands are palpable, but very little enlarged.

Rectal.—The prostate is very large, projecting far towards the rectum, markedly indurated, the induration extending upward and involving the seminal vesicles. On the right side a hard, rounded cord extends upward beyond the upper end of the seminal vesicle along the lateral wall of the pelvis, and on the left side several large indurated cords are felt, which extend beyond the sacro sciatic notch and are accompanied by shot-like glands. An intravesicular plateau of induration is felt above

the prostate. The surface of the prostate and vesicles is irregular and very hard, but only slightly tender. A few hard glands are to be felt in the sacral fossa, but none along the right lateral wall of the pelvis. The left lobe of the prostate and left seminal vesicle are distinctly larger than the right. The mucous membrane of the rectum is close to the prostate, but is apparently not adherent.

Cystoscopic.—A catheter passes with ease and finds only 50 cc. residual urine. The bladder capacity is contracted, holding only 100 cc. The cystoscope shows a considerable irregular outgrowth of the prostate all around the orifice with very shallow clefts in front. The median and lateral portions of the prostate are about equally enlarged, and all are of moderate degree. The mucous membrane covering the prostatic outgrowth is irregular, in places deeply fissured, but nowhere ulcerated or villous in type. The trigone and ureters are concealed behind the median enlargement of the prostate. The bladder is trabeculated and inflamed, but apparently not invaded. With finger in rectum and cystoscope in urethra there is a great increase in the subtrigonal and suburethral tissues so that the beak cannot be felt. No operation advised.

May 1, 1906.—Report by daughter. " The patient has not been catheterized since leaving the hospital, but has had continual incontinence and has worn a urinal. He has had no pain in the bladder or urethra, no difficulty of urination and no hematuria. About once a week he has had an attack of very severe pain which starts in the back, on the right side, and radiates thence down the back of the right thigh to the toe. The severe pain continues for about five minutes and recurs several times during a period of 24 to 48 hours, during which time there is a dull pain in the back on the right side. He has never had any pain in the left back, thigh or leg. There is no difficulty in voiding urine."

Case 56.—*Carcinoma of prostate, seminal vesicles and trigone. Duration two and a half years. Symptoms: Hematuria, frequency, pain. No operation.*

No. 1040. T. E. D., age 56, admitted September 23, 1905.

Complaint.—" Bladder and kidney trouble."

Gonorrhœa twice, when about 30 years of age; was apparently perfectly cured.

Present illness began two and a half years ago, with frequent passage of blood before urination, but not associated with pain. In November, 1904, the patient became unconscious and remained so for two weeks, and after that he was never able to work on account of weakness. Until April, 1905, there was no pain or urinary disturbance. The patient then began to have pain in the rectum, worse after stool, and pain at the end of urination, located in the end of the penis. Since then urination has been more frequent, and of late there has been pain in the perineal region and frequently in the rectum, occasionally radiating to the buttocks. He has had no pain in back, hips, legs, testicles nor abdomen. He has lost 40 pounds.

S. P.—Urination four or five times during the night and the same number during the day. Pain in the end of the penis before and after urination, occasionally pain in the perineum and rectum. No hematuria.

Examination.—The patient is a fairly well nourished man. Chest and abdomen—no note made.

Rectal.—The prostate is very little larger than normal, but at the upper end of the right lateral lobe a peculiar, oval, indurated mass, which extends upward and outward into the region of the seminal vesicle for a distance of 3 cm. is felt. Its upper end is sharply defined, rounded, and to its inner side is an indurated cord which extends upward and outward beyond the reach of the finger, and is taken for the vas deferens. The left seminal vesicle is palpable and apparently normal. The prostate is indurated, but not of stony hardness. The surface is a little irregular, particularly in the region of the right lateral lobe, which is more tender

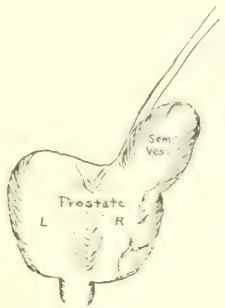


FIG. 22. Case 56.

than the left. There is practically no intervesicular mass and the bladder feels soft. No enlarged glands are to be felt along the lateral walls of the pelvis nor in the sacral fossa. The rectal mucosa is soft, freely movable, and there is no periprostatic induration. The accompanying diagram (Fig. 22) shows the shape of the prostate and indurated vesicle. The prostatic secretion contains numerous micrococci.

Urinalysis.—Urine almost clear, 1022, acid, no albumin, no sugar. Microscopically, a few pus cells, a few round squamous epithelial cells.

Cystoscopic.—A coudè catheter passes with ease and finds 90 cc. residual urine. The bladder capacity is large. Study of the prostatic orifice shows only a slight enlargement of the median portion of the prostate which is somewhat irregular but covered with smooth mucous membrane. The lateral lobes are not enlarged and there are no sulci present. Behind the median portion of the prostate the trigone is elevated by rounded mass about 2 cm. in diameter, and covered by smooth mucous membrane. This elevation lies in front of the interureteral ligament, being separated from it by a fairly deep pouch. The ureteral orifices are situated in hypertrophied ridges, but otherwise normal. The bladder wall is slightly

trabeculated, but not inflamed. With finger in rectum and cystoscope in urethra the beak can be felt with ease, the tissues beneath the trigone do not seem to be thickened in the median line. To the right of the beak the oval indurated mass in the region of the right seminal vesicle is felt. In the region of the left seminal vesicle nothing abnormal is made out. The median portion of the prostate is distinctly thickened and much harder than normal.

October 12.—The patient has been passing more blood for the past few days, but urination is less difficult and less frequent. His only pain now is a slight, dull pain in the lower back.

Rectal examination shows an induration at the base of the left seminal vesicle, and a small transverse intravesicular plateau of induration as shown in the accompanying diagram. It is easy to pass beyond the indurated areas, but one or two cords are felt on the right side. No indurated glands are to be felt along the lateral walls of the pelvis and sacral fossa.

Diagnosis.—Carcinoma of the prostate and seminal vesicles, with involvement of trigone. No operation.

April 10, 1906.—Letter. "After returning home the course of the disease was about the same as before, viz.: difficulty of urination, pain in the rectum, hematuria about once a month, generally continuing for about a week, constipation. No other operation has been performed. At present the patient is worse, suffers more pain, but urination is natural, but very frequent both day and night. The catheter is not used."

CASE 57.—*Carcinoma of prostate, vesicles, membranous urethra. Duration five months. Frequency and pain. No operation.*

No. 1111. J. W. R., age 68, married, admitted December 3, 1905.

Complaint.—"Prostatic trouble. Frequency and difficulty of urination."

No history of gonorrhœa.

Present illness began five months ago with frequency and difficulty of urination. For one year previous to this he had gotten up twice at night to urinate, but there was no obstruction and no pain. During the past five months there has been only a slight increase in the difficulty and frequency of urination, but there has been considerable pain which comes on when the bladder becomes full, and is quite sharp during urination, but disappears after it. The pain is referred to the end of the penis. He has had no pain in the bladder, perineum, deep urethra, rectum, thighs, hips, or abdomen. He has lost 10 pounds in the past six months.

S. P.—Micturition five times during the night and four times during the day. At times the stream is almost normal in size, at others it is small, and occasionally there is a slight dribbling. When the bladder becomes full he has an urgent desire to urinate associated with pain, and during urination he has pain in the end of the penis. Between urinations he is comfortable. He has never had retention of urine nor been catheterized. His bowels move regularly without difficulty and without pain.

Examination.—The patient is fairly well nourished, but is pale and looks badly. Chest and abdomen, no note made.

Genitalia.—The right testicle lies in the external inguinal ring and is small. The glands in the groins are not enlarged and the deep iliac glands are not palpable nor are the epitrochlears, axillaries or cervicals. On the left side deep palpation reveals an indurated mass along the brim of the pelvis which is distinctly painful.

Rectal.—The prostate is considerably enlarged, particularly on the right, irregular with sharp lateral borders. The median furrow is present, notch is obliterated, the consistence is very hard and quite tender. The anterior portion of the prostate is very close to the triangular ligament, the membranous urethra is large and hard. The right seminal vesicle is replaced by a mass of indurated tissue, on the surface of which several hard cords are made out, extending upward and outward along the lateral wall of the pelvis as far as the finger can reach. In the region of the left seminal vesicle a similar indurated mass at least one and one-half inches broad, and also extending along the pelvic wall beyond the reach of the finger, is present. Between the two seminal vesicles, and above the prostate is a broad plateau of induration with a sharp concave upper border. A large gland is felt on each side of the pelvis, but nothing is made out in the sacral fossa. The musculosa of the rectum is apparently closely adherent to the prostate, but the mucosa is smooth and movable.

Cystoscopic.—A large coudé catheter passes with ease meeting very little obstruction and finds only 30 cc. residual urine. The bladder capacity is quite small, 90 cc. being introduced with difficulty. The cystoscope enters with ease and shows a small but greatly trabeculated bladder. The ureters and trigone cannot be seen owing to a fairly broad median prostatic bar with a deep pouch behind it. The mucosa is everywhere smooth and there is no evidence of neoplastic growth. The lateral lobes of the prostate are not intravesically enlarged, there is no cleft between them in front, nor on either side of the median bar. With finger in rectum and cystoscope in urethra it is impossible to feel the beak of the instrument, and an extensive hard intravesicular subtrigonal mass is to be felt, and the suburethral portion of the prostate is greatly increased in thickness.

Urinalysis.—Cloudy, acid, 1024, no albumin, no sugar, no casts nor pus. Few epithelial cells.

Diagnosis.—Carcinoma of the prostate and seminal vesicles. Operation not advised.

March 22, 1906.—Report by daughter. "The patient has lost greatly in flesh. Has been very sick and is extremely emaciated and weak. The catheter has not been used, and micturition is now very frequent—about every 15 minutes night and day. There has been no hematuria. He suffers considerably from great soreness in the lower abdomen and intermittent severe pain down the left thigh and leg which extends into the foot. He also has occasionally severe pain in the chest and throat and has difficulty and pain in swallowing. He takes opiates regularly."

Case 58.—*Carcinoma of prostate and seminal vesicles. Duration two and one-half years. Pain severe, urination frequent. No hematuria. No operation.*

No. 1180. L. N., age 72, married, seen in consultation at Elkins, W. Va., January 13, 1906.

Complaint.—"Pain in left leg, buttock, and hip. Inability to use left leg. Frequency of urination."

No history of gonorrhœa. No previous urinary trouble.

About two and one-half years ago the left epididymis became swollen to the size of a walnut. His physician examined the prostate and found it considerably enlarged. There was very little evidence of obstruction and no symptoms from it, and the urine was normal. The epididymitis soon disappeared under treatment.

About 15 months ago the patient began to have pain in the left groin and scrotum, dull in character and constantly present with intermittent acute paroxysms. There was no marked urinary difficulty, no pain on micturition, no hematuria. During the past year the pain as above described has gradually increased and the patient has grown considerably weaker. He was seen a second time by his physician, Dr. Golden, on October 28, 1905. He was then complaining of shooting pains down the left thigh to a point just below the patella. These pains were aggravated by extending or abducting the thigh, and he was most comfortable with the left thigh and leg drawn up. There was also considerable pain in the lower portion of the left buttock, and at a point just above the crest of the ilium behind.

Examination showed a point of exquisite tenderness on pressure, limited to the tuberosity of the left ischium, and also a small area over the posterior border of the crest of the left ileum near the synchrondrosis. The prostate was found to be much larger than when seen two years before, hard, slightly tender, but smooth. There was considerable frequency of urination, but no pain in the bladder or urethra. A catheter was difficult to introduce and withdrew 12 ounces of residual urine. During the past three months the condition of the patient has remained about the same.

S. P.—Micturition every one to two hours, and often every half hour at night. Total amount in 24 hours, 30 ounces. Urine passes without much difficulty, but some times he strains considerably. He has not had complete retention. He has no pain in bladder, penis, or rectum, but defecation is difficult. There is a constant pain in the lower portion of the left buttock and in the back of thigh and the left groin. There is also a slight pain in the left testicle.

Examination.—The patient is a thin, nervous-looking man. The heart lungs, abdomen, and genitalia are negative. Enlarged glands are present in both groins.

Pressure upon the tuberosity of the left ischium causes exquisite pain, but there is no pain in the structures around it. Along the posterior border of the crest of the ilium near the synchrondrosis there is severe

pain on pressure for a distance of about 3 cm. No other painful points or areas made out.

Rectal.—The prostate is moderately enlarged, smooth and not tender. The right lobe is only slightly indurated, but the left is very hard and has a sharp lateral border. The region of the left seminal vesicle is occupied by a broad area of great induration continuous with the upper end of the prostate, and extending upward and outward along the lateral wall of the pelvis to which it is closely adherent as far as the finger can reach. The surface is irregular and several hard cords are present. The right seminal vesicle is also enlarged and indurated, but much less so than the left. An intravesicular plateau of induration with a concave upper border is present. No enlarged glands are made out. The rectum was apparently not involved. No instrumental examination of urethra and bladder was made. His physician reported that there was only a small amount of residual urine and that catheterization was not necessary, the patient being able to void without much difficulty. No operation was advised.

June 1, 1906.—Letter. "The patient died about six weeks after your visit. He was treated by X-ray without benefit and continued to suffer severely from pain."

CASE 59.—*Carcinoma of prostate, seminal vesicles, and pelvic glands. Duration two years. Frequency, burning pain in back, hips and thighs. No operation.*

No. 1186. G. D., age 60, married, admitted January 16, 1906.

Complaint.—"Difficulty of urination."

Gonorrhœa at age of 23 years. No sequelæ.

Present illness began two years ago with burning on urination which came on at irregular intervals. A little later he suffered with pain in the lumbar region, but under treatment both symptoms disappeared for five months. During the past 18 months he has had repeated attacks of burning on urination, difficulty in voiding, and pain in the back, and urination has become steadily more frequent. During the past four months he has had pain in the hips and legs. Sexual desire has been absent for two years.

Status præsens.—Urination every half hour during the day, and from two to six times at night. Urine difficult to start, stream small, often comes in driblets. Pain in the back, hips, and legs, and in the bladder after urination; during micturition there is a burning in the urethra. Has lost 10 pounds and grown weaker. The pain is more or less constant and worse in the right side of back, and right hip. No hematuria.

Examination.—Fairly well nourished man. Chest and abdomen not noted.

Rectal.—The prostate and seminal vesicles are involved in an indurated mass. The prostate is considerably enlarged, irregularly nodular, and of stony hardness. The induration extends into the region of the seminal vesicles, and on the left side along the pelvic wall as far back as the sacrum. In the intravesicular space a plateau of marked induration is present. Indurated lymphatic glands are to be felt on both sides of the pelvis and in the groin.

Cystoscopic.—A coudé catheter passes with ease and finds 160 cc. residual urine. The bladder capacity is 340 cc. The cystoscope shows a fairly large rounded median lobe with a shallow sulcus on either side which projects well into the bladder and covers up the trigone so that it is impossible to see the ureters or the interureteral ligament. The lateral lobes of the prostate are very little enlarged intravesically. The mucous membrane covering the prostate is smooth. The bladder wall is slightly trabeculated. There is no intravesical tumor or evidence of infiltration of the bladder wall. With finger in rectum and cystoscope in urethra the beak of the instrument cannot be felt owing to an extensive subtrigonal mass of induration. The suburethral portion of the prostate is also thickened and greatly indurated.

Urinalysis.—Clear. No albumin, no pus, no bacteria. Neither operation nor catheter advised.

Case 60.—*Carcinoma of the prostate, seminal vesicles, membranous urethra, pelvic and iliac and inguinal glands. Duration four months. No pain, no frequency of urination, no hematuria. Only symptom present swelling of leg and thigh. No operation. No catheterism.*

P. R., age 58, married, admitted February 9, 1906.

Complaint.—" Swelling of the left leg."

Gonorrhœa at the age of 36, no sequelæ.

Present illness began four months ago when he first noticed swelling of the left leg. The swelling came on suddenly and involved the right foot, leg, and thigh, and very soon reached considerable size, was not accompanied by pain, difficulty or frequency of urination or due to any ascribable cause. This swelling has persisted up to the present time, and there have been no other symptoms. He has been arising twice at night to urinate for the past two years, but micturition is free and painless and has never been accompanied by hematuria. He has lost 10 pounds in weight during the last four months, and his general health has failed somewhat.

Sexual powers.—Normal up to four months ago, since then no desire and no erections.

Status præsens.—The only symptom of which the patient complains is a swelling on the left lower limb from the hip to the foot, which is increased by standing and decreases after remaining in bed several hours. He has no pain in this region nor in the groin. Urination is normal during the day and he arises only twice at night to void. There has never been any hematuria; no difficulty of urination, no pain in the bladder, urethra, rectum, thighs, hips, or back.

Examination.—The patient is well nourished, but somewhat pale. The arteries are thickened but not nodular. The chest and abdomen are negative. In the left groin is an extensive mass of confluent glands 10 x 7 cm. in size. They are quite hard and immovable being firmly attached to the deeper structure. There are no areas of fluctuation, the skin is not adherent and is of normal color. The left thigh and leg are considerably swollen, the skin is of a bluish color. The right thigh and leg are normal

in size there is no pitting on pressure. The scrotum is normal in appearance, there is no œdema. The testicles, epididymis, and cords are normal.

Rectal.—The prostate presents a peculiar irregular enlargement. The right lateral lobe presents a prominent smooth, oval mass about the size of a hen's egg in its upper two-thirds as shown in Fig. 23. This mass rises at least 3 cm. above the surface of the prostate, is tense, elastic almost fluctuating, but is not tender. The anterior portion of the right lobe is not enlarged, but is distinctly indurated. The right vesicle is slightly indurated and several hard cords are felt on its surface, these extend out to the pelvic wall. The left lobe of the prostate is much less prom-



FIG. 23.—Rectal chart with outlines of induration of prostate, vesicles, lymphatics and pelvic glands shown in comparison with normal (in dotted lines). Case 60.

inent than the right, but is broader, more indurated, very irregular and nodular. The mass of induration extends much farther anteriorly than the normal outlines of the prostate, apparently involving the membranous urethra, and extending well down towards the perineum to a point just beneath the skin as shown in the accompanying diagram. At the upper end the mass extends into and involves the seminal vesicles and structures along the lateral wall of the pelvis to which the prostate and seminal vesicle are markedly adherent. With the finger directed anteriorly, a mass of glands, evidently the deep iliacs, are felt, and several indurated lymphatics connecting them and the mass in the lateral wall of the pelvis are made out. The intravesicular space is very little involved, and the bladder above feels soft.

No enlarged glands are palpable in the region of the right vesicle or in the right lateral wall of the pelvis. The rectal mucosa is soft, not adherent,

not ulcerated. The axillary glands are palpable but soft. The epitrochlear and cervical are not palpable.

Urinalysis.—Clear, acid, of normal specific gravity. Chemically and microscopically negative.

Remark.—No instrumental examination of the bladder was made because the patient had practically no difficulty or frequency of urination and no pain. The diagnosis of carcinoma was positive, and cystoscopy might have produced traumatism or infection. The patient was advised to bandage leg and to have it massaged. He was followed for about two months. His only complaint was swelling of the leg which was worse on standing and incapacitated him for heavy work. He suffered no pain, no difficulty, no frequency of urination, no hematuria.

May 15, 1906.—The condition remains about the same. He has no urinary trouble and no pain. His only complaint is swelling of the leg.

CASE 61.—*Carcinoma of prostate with extensive intravesical tumor outgrowth around the urethral orifice. Involvement of both seminal vesicles, and lymphatics. No operation.*

S. No. 18,995. J. R. C., age 78, married, admitted April 7, 1906.

Complaint.—" Bladder trouble."

No history of gonorrhœa.

Present illness began about six months ago with involuntary escape of urine into his clothes. A large amount of urine was discharged, there was no pain or other symptoms. Examination of the urine at that time showed considerable pus. He was treated by irrigations through a catheter with improvement. The course of the disease has been characterized by gradually increasing difficulty and pain which has become so severe during the past three weeks as to be almost unbearable. Of late the urination has been extremely difficult, and accompanied by intense pain in the rectum, bladder, penis, and down the thighs and legs, and lasting for several minutes after urination. He has never had hematuria, complete retention of urine, nor gravel. He has lost 15 pounds in weight and very greatly in strength. Erections and sexual desire have been absent for years.

Status præsens.—Almost constant dribbling of urine night and day. Frequent attempts at urination with the passage of small amounts and severe pain in the bladder, urethra, rectum, and thighs. No sharp colicky pains.

Examination.—The patient is well nourished. There is no evidence of emaciation or cachexia. The mucous membranes are of good color. The chest is barrel-shaped, percussion hyperresonant, expiration prolonged. The heart is enlarged, but there are no murmurs. The abdomen is negative. Genitalia negative.

Rectal.—There is considerable equilateral enlargement of the prostate. The surface is smooth and there are no nodules. It is definitely but slightly indurated, but there is no tenderness. The prostate is quite fixed to the surrounding structures of the pelvis, but the membranous urethra is normal. In the region of the right seminal vesicle is a mass of indura-

tion continuous with the prostate, and on the surface are several indurated cords which run outward toward the pelvic wall to which the enlarged vesicle is bound by adhesions. The left seminal vesicle is less indurated than the right, but there are several hard cords on its surface. In the intravesicular region there is a small but definite mass of induration and the bladder wall feels hard. The rectal mucosa is soft and not adherent. No definite enlarged glands are made out.

Cystoscopic.—The patient voided 5 cc. of cloudy urine. A coudé catheter enters easily and finds 50 cc. residual urine and a bladder capacity of 60 cc. The cystoscope shows an irregular shaggy growth all around the prostatic orifice as shown in the accompanying chart, Fig. 24. As seen here the surface is very irregular, in places composed of villi, and in others larger, irregular, more or less pedunculated masses. No definite smooth lobes or typical intralobular clefts such as one sees in prostatic hypertrophy seen. Study of the bladder is very unsatisfactory owing

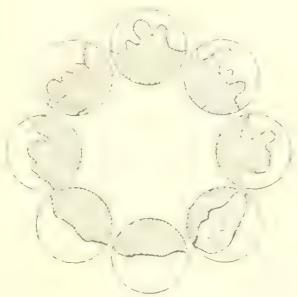


FIG. 24.—Cystoscopic chart showing irregular tumor growth around prostate orifice. Case No. 61.

to its small size and the presence of pus and blood. There was no calculus seen, and searching with the instrument failed to reveal any grating. With finger in rectum and cystoscope in urethra the beak of the instrument could not be felt owing to marked increase in thickness in the region of the trigone and median portion of the prostate. The suburethral portion of the prostate is considerably thicker and harder than normal. The patient remained in the hospital two days during which time urine was voided at very frequent intervals and in very small amounts, 10 to 20 cc. at a time. There was also almost constant dribbling of urine. No operation was advised.

CASE 62.—*Carcinoma of prostate, seminal vesicles, and membranous urethra, furnishing only slight symptoms. No operation. No catheterism.*

No. 1263. A. A. L., age 59, widowed, admitted April 12, 1906.

Complaint.—"Frequent and painful urination."

Gonorrhœa at the age of 24—light case, no gleet or stricture following. No impairment of sexual powers. Has been generally healthy.

Present illness began six months ago with slight difficulty and increased frequency of urination, particularly at night, patient having to arise two to three times to urinate. Previous to that did not arise more than once at night to void and general health was excellent. Later patient began to have pain at beginning of urination located in the deep urethra produced by straining in order to start the flow of urine. During the past six months there has been slight increase in the difficulty and frequency, but there has been no increase in the pain and no involvement of other regions. He has not lost weight or strength and his general health is good. Has never passed blood nor calculus.

Six weeks ago consulted Dr. Keidel. At that time he was voiding urine about every two hours night and day, urine was clear and sterile. Catheterization was somewhat difficult, silver catheter being finally used and 150 cc. residual urine withdrawn, bladder capacity was normal. During the past six weeks he has had occasional massage, has been catheterized twice with some improvement.

S. P.—Patient voids urine four times during the night and about every two to three hours during the day. Urine difficult to start, and the stream is exceedingly small. No terminal dribbling. There is a slight spasmodic pain in efforts to start flow of urine, but usually no pain at end of urination, no hematuria. Has occasional dull aching pain in the lumbar region of both sides, slight in character. (This has been present two to three months.) Never any pain in hips, thighs, groin, or testicles.

Sexual powers.—During the past six months erections have been very infrequent and weak, insufficient for coitus.

Examination.—Patient is a healthy looking man. No arterio-sclerosis, pulse full and regular. The abdomen is very fatty and pendulous, making examination unsatisfactory.

Genitalia.—Left epididymis slightly enlarged and indurated. Right testicle is rotated, globus major being below. The cord of the vas deferens is considerably enlarged and indurated almost up to the ring.

Rectal.—Prostate is slightly larger than normal, very little increased transversely. Surface is smooth, irregular and near the apex of the left lobe is a prominent hard small nodule. In consistence it is considerably indurated, the induration extending forward along the membranous urethra. Prostate is very fixed being firmly attached particularly on the right side to the adherent structures and to the triangular ligament. Extending upward on each side in the region of the seminal vesicle is an indurated mass which is greatest on the left side. On the right side several hard cords are felt extending beyond the reach of the finger, and running along the lateral wall of the pelvis. Between the cords, soft tissue is felt " probably healthy seminal vesicle." There are only moderate adhesions to the pelvic wall. In the region of the left seminal vesicle are several indurated cords which extend upward and outward along the lateral wall of the pelvis beyond reach of the finger. One indurated gland is felt among them. Some soft tissue is felt beneath the cords There is

considerable induration along the pelvic wall. In the intravesicular region a definite mass of moderate induration is made out. The striking feature about the case, is the induration low down about the membranous urethra; small size of the prostate and presence of some softness in the upper portions of the prostate and in the seminal vesicles and presence of numerous indurated cords.

Cystoscopic.—The patient was placed on the table for cystoscopic examination. A small coudè catheter passed with ease but detected some constriction of the membranous and prostatic urethra. There was only a small amount of residual urine present, the bladder was somewhat contracted. An attempt was made to pass the cystoscope, but it was impossible to introduce it through the membranous urethra. Some hemorrhage was produced and it was thought best to desist rather than to produce too much trauma. No treatment advised.

CASE 63.—*Carcinoma of prostate, seminal vesicle, pelvic glands, and membranous urethra. Duration six months. Frequency of urination, pain in back. No operation.*

G. U. No. 17,647. S. B., age 66, married, admitted April 19, 1906.

Complaint.—" Frequency of urination, dribbling, pain."

Patient denies gonorrhœa.

Present illness began six months ago with frequency of urination. The stream was small, irregular and intermittent. This gradually increased and four months ago he was voiding urine about every 15 minutes night and day. Three months ago he had a sudden complete retention of urine which lasted for 24 hours and was relieved by a catheter. He has been able to void urine voluntarily since, and urination has been less frequent, but he has suffered pain in the back, both lumbar and sacral regions and in the left buttock and hip. He has lost considerable weight and is much weaker. He has not passed blood or gravel. His sexual powers have completely disappeared.

Status præsens.—Urination eight to ten times during the day; two to four at night. Pain in back, left buttock and hip, and an indefinite feeling of distress directly after urination. There is a considerable involuntary escape of urine. He is weak and has lost his nerve.

Examination.—No note as to general examination.

There is no urethral discharge. The urine is cloudy in all three glasses.

Rectal.—The prostate is very much enlarged, irregular, nodular and of stony hardness. The surface is somewhat flat. On both sides the prostate extends to the pelvic wall to which it is closely adherent. The induration extends into the region of both seminal vesicles as far as the finger can reach and there is a large intravesicular mass with a hard nodular surface. Both vesicles are firmly adherent to surrounding structures and along the outer edge of the left vesicle a number of small indurated glands are felt. The induration extends downward along the membranous urethra especially on the right side. Glands are felt along the pelvic wall on the

right side, in both groins and in the right axilla, and along the left vesicle as mentioned above. There are no glandular masses palpable in the abdomen.

Case 64.—*History not obtained. Autopsy at Bay View. Large soft prostate with peculiar colloid metastases.*

The specimen, G. U. 292, was obtained at autopsy on white male, age 65, by Dr. Bunting. The prostate was symmetrically enlarged, the enlargement affecting chiefly the lateral lobes, the gland was softer than normal (at autopsy). On section the prostate is found to have an opaque yellowish white medullary appearance which is quite uniform except at the extreme periphery where the tissue is more translucent. At several points, however, the capsule is found invaded by the opaque tissue. Beneath the mucosa of the bladder near the urethral angle of the trigone are two small nodules of tissue similar to that of the prostate, the larger of which measures about 5 mm. in diameter, otherwise the bladder appears normal and its walls are slightly hypertrophied. Extending from the posterior surface of the prostate into the cellular tissue between it and the rectum is a mass of firm fibrous tissue in which are opaque whitish areas, and in addition, masses of translucent gelatinous material. This extension reached the perineum. Scattered over the peritoneal surface generally reaching the greatest development of the omentum the diaphragm and about the spleen and tail of the pancreas and numerous similar gelatinous nodules, varying in size from a few mm. to 1 or 2 cm. On the diaphragm these form grape-like clusters, gelatinous materials. The organs in general are free from internal metastases. There is moderate dilatation of the urethra.

Microscopic examination.—Sections from the prostate shows a very cellular carcinoma. It is of the carcinoma simplex type, occasionally large alveoli filled with cells polymorphus in shape and with a small round regularly staining nucleus are seen. About these alveoli broad bands of stroma are inserted. The major part of the carcinoma shows no distinct alveolar arrangement, but consists of a mass of cells rather loose, with here and there small strands of fibrous stroma interlacing in various directions. (See Fig. 13.) The carcinoma is extremely cellular, and shows a very insignificant amount of stroma. A fair sized vein whose walls are lined with a rather cuboidal type of epithelium is noted in one section. The epithelium which is very irregular in shape and size sometimes occurs in solid sheets, and again is broken up forming irregular open spaces. In a few small limited areas the carcinoma assumes an adenoma type. Sections from metastases to the diaphragm show a complete colloid transformation of these metastases.

Diagnosis.—Carcinoma simplex with colloid metastases.

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